Vol. 1064 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

March 18, 1986

U.S.
DEPARTMENT
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 18, 1986 Volume 1064 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 15, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,376,312 through 4,377,006
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the pa-

tent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 29, 1985 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,307,703	06/249,944	12/29/81
4,307,706	06/215,977	12/29/81
4,307,768	06/215,710	12/29/81
4,307,869	06/216,304	12/29/81
4,307,964	06/238,191	12/29/81
4,308,041	06/232,466	12/29/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,165,128, Re. S.N. 817,717, Filed Jan. 10, 1986, Cl. 297/367, INTERTIALLY LOCKED HINGE FOR MOTOR VEHICLE SEAT, Willibald Strowick, et al., Owner of Record: *Keiper U.S.A., Inc., Battle Creek, Mich.*, Attorney or Agent: Lloyd M. Forster, Ex. Gp.: 357

4,235,026, Re. S.N. 803,334, Filed Dec. 2, 1985, Cl. 036/32R, ELASTOMERIC SHOESOLE, Stanley C. Plagenhoef, Owner of Record: *Motion Analysis, Inc., Amherst, Mass.*, Attorney or Agent: Charles Hieken, Ex. Gp.: 247

4,403,541, Re. S.N. 775,408, Filed Sept. 12, 1985, Cl. 99/385, HEAT TRAPPING COOKING GRILL, Bernard B. Berger, Owner of Record: *Ducane Heating Corp., Columbia, S.C.*, Attorney or Agent: Townsend M. Belser, Jr., et al., Ex. Gp.: 242

4,427,249, Re. S.N. 821,649, Filed Jan. 23, 1986, Cl. 339/17 CF, LOW HEIGHT ADS CONNECTOR, Edward John Bright, et al., Owner of Record: *AMP, Inc., Harrisburg, Pa.*, Attorney or Agent: Jay L. Seitchik, Ex. Gp.: 322

4,496,490, Re. S.N. 798,637, Filed Nov. 15, 1985, Cl. 260/429.7, NON-TOXIC ORGANOTIN STABILIZERS FOR VINYL CHLORIDE POLYMERS, William A. Larkin, Owner of Record: *M & T Chemicals, Inc., Woodbridge, N.J.*, Attorney or Agent: Sheldon H. Parker, et al., Ex. Gp.: 124

4,528,429, Re. S.N. 772,110, Filed Sept. 3, 1985, Cl. 200/50B, ELECTRICAL SWITCH-PLUG ASSEMBLY WITH BAFFLE, William C. Dobson, Owner of Record: *Dart Industries, Inc., Northbrook, Ill.*, Attorney or Agent: Gregory J. Mancuso, et al., Ex. Gp.: 214

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,737,433, Reexam. No. 90/000,956, Requested: Feb. 11, 1986, Cl. 544/271, CERTAIN OXOALKYLDIMETHYLXANTHINES, Werner Mohler, et al., Owner of Record: *Hoechst AG, Frankfurt, Dex.*, Attorney or Agent: I. M. Aisenberg, Ex. Gp.: 120, Requester: James B. Costian, New York, N.Y.

3,835,118, Reexam. No. 90/000,898, Requested: Nov. 5, 1985, Cl. 523/155, SPONGE IRON FRICTION MATERIAL, Seong Kwan Rhee, et al., Owner of Record: *Allied Corp., South Bend, Ind.*, Attorney or Agent: Leo McCormick, Ex. Gp.: 123, Requester: Owner

3,864,102, Reexam. No. 90/000,892, Requested: Nov. 1, 1985, Cl. 55/30, DEHYDRATION OF A PIPELINE WITH A PORTABLE DRY AIR GENERATING PLANT, Marvin D. Powers, Owner of Record: *Pipeline Dehydration, Inc., Houston, Tex.*, Attorney or Agent: None, Ex. Gp.: 130, Requester: Coulter Services Co., Houston, Tex.

4,115,732, Reexam. No. 90/000,951, Requested: Feb. 5, 1986, Cl. 324/72, DETECTION SYSTEM FOR LIGHTNING, Edmund P. Krider, et al., Owner of Record: *The University of Ariz. Foundation, Tucson, Ariz.*, Attorney or Agent: Mason, Kolemainen, et al., Ex. Gp.: 260, Requester: Atlantic Scientific Corp., Melbourne, Fla.

4,287,015, Reexam. No. 90/000,950, Requested: Feb. 3, 1986, Cl. 156/382, VACUUM BAG USED IN MAKING LAMINATED PRODUCTS, Harold J. Danner, Owner of Record: *Zip-Vac, Inc., Auburn, Wash.*, Attorney or Agent: John O. Graybeal, Ex. Gp.: 130, Requester: Northrop Corp., Hawthorne, Calif.

4,351,172, Reexam. No. 90/000,896, Requested: Oct. 31, 1985, Cl. 70/366, CYLINDER LOCK MECHANISM, Kaarlo Martikainen, Owner of Record: *Oy Wartsila AB, Helsinki, Finland*, Attorney or Agent: Cohen, Pontani, et al., Ex. Gp.: 350, Requester: Owner

4,414,634, Reexam. No. 90/000,955, Requested: Feb. 10, 1986, Cl. 364/510, FLUID FLOW TOTALIZER, Timothy R. Louis, et al., Owner of Record: *Scott & Fetzer Co., Westlake, Ohio*, Attorney or Agent: Louis V. Granger, Ex. Gp.: 230, Requester: Owner

4,451,707, Reexam. No. 90/000,954, Requested: Feb. 7, 1986, Cl. 179/84R, RING DETECTOR AND TELEPHONE LINE MONITORING SYSTEM FOR TELEPHONE ANSWERING INSTRUMENT, Bradford E. Hanscom, Owner of Record: *Fortel Corp., Compton, Calif.*, Attorney or Agent: Keith Beecher, Ex. Gp.: 260, Requester: Phone-Mates, Inc., Torrance, Calif.

4,474,600, Reexam. No. 90/000,953, Requested: Feb. 5, 1986, Cl. 71/92, HERBICIDALLY ACTIVE NOVEL SUBSTITUTED PHENYLSULFONYLUREA DERIVATIVES, Masahiro Aya, et al., Owner of Record: *Nihon Torushu Noyaka Seizo K.K., Tokyo, Japan*, Attorney or Agent: Sprung, Horn, et al., Ex. Gp.: 120, Requester: E. I. du Pont de Nemours & Co., Wilmington, Del.

4,495,336, Reexam. No. 90/000,952, Requested: Feb. 5, 1986, Cl. 252/8.55E, MERCAPTO-POLYCARBOXYLIC ACIDS, Rudolf H. Hausler, et al., Owner of Record: *Petrolite Corp., St. Louis, Mo.*, Attorney or Agent: Sidney B. Ring, Ex. Gp.: 220, Requester: Ciba-Geigy Corp., Ardsley, N.Y.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceed-

ings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Rent-A-Mom, Ltd., Northlake, Ill., Reg. No. 1,172,574, for the mark "RENT-A-MOM", Canc. No. 14,758.

Econo-Car International, Inc., Coral Gables, Fla., Reg. No. 795,732, for the mark "ECONO-TRUCK", Canc. No. 14,878.

Econo-Car International, Inc., Coral Gables, Fla, Reg. No. 903,389, for the mark "ECONO-CAR", Canc. No. 14,887.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Trademark Expo '86

The Fourth Annual National Trademark Expo will be held on July 26-27 in the National Tourist Center at the Great Hall of the Department of Commerce in Washington, D.C. The exhibition, which is open to the public free of charge, attracted more than 20,000 visitors last year. Co-sponsored by the PTO's Trademark Examining Operation and The United States Trademark Association, the Expo demonstrates the importance of trademarks to business and consumers. The theme this year is "Trademarks: How Business Makes Its Mark."

Trademark owners and those in the trademark field are invited to participate in Expo '86. It is a unique opportunity to demonstrate the importance of trademarks and to educate consumers about proper trademark usage. The only requirement is that the exhibit involve trademarks. For example, the exhibit can show how a trademark identifies the source of goods or services, how it is used in marketing or how a trademark was adopted or has evolved. Personified trademarks, audiovisual displays, product demonstrations, product samples and informational literature are all successful attention grabbers.

The fee for an exhibit space 10 feet wide and 8 feet deep is $250. Requests for applications should be addressed to

Margaret M. Laurence
Trademark Expo '86
U.S. Patent and Trademark Office
Washington, D.C. 20231

For further information, call Gary Shaffer or Michelle Wiseman at (703) 557-5237. Applications must be submitted by May 15, 1986.

MARGARET M. LAURENCE,
Feb. 13, 1986. *Assistant Commissioner,*
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 18, 1986

D. 276,569	4,526,983	4,546,227	4,554,838
Re. 31,254	4,531,056	4,547,495	4,554,947
3,700,681	4,532,139	4,547,511	4,554,951
4,182,763	4,532,199	4,547,553	4,554,970
4,294,879	4,532,644	4,548,286	4,555,137
4,297,346	4,532,871	4,548,478	4,555,661
4,318,043	4,533,486	4,548,904	4,556,143
4,331,575	4,533,733	4,548,924	4,557,016
4,369,446	4,535,231	4,548,944	4,557,365
4,395,462	4,535,994	4,549,153	4,557,713
4,395,478	4,536,881	4,549,368	4,557,925
4,402,744	4,537,531	4,549,422	4,558,135
4,417,059	4,537,985	4,550,290	4,558,532
4,421,719	4,538,688	4,550,455	4,559,129
4,449,227	4,538,966	4,550,595	4,559,130
4,454,108	4,540,274	4,550,736	4,559,750
4,472,328	4,540,379	4,551,311	4,559,795
4,490,371	4,540,390	4,551,488	4,560,375
4,490,707	4,540,614	4,551,504	4,560,397
4,495,340	4,540,697	4,551,531	4,560,437
4,495,659	4,540,890	4,552,021	4,560,489
4,497,551	4,541,641	4,552,353	4,560,675
4,504,745	4,542,188	4,552,771	4,561,002
4,505,988	4,542,293	4,552,866	4,561,106
4,510,505	4,542,747	4,553,172	4,561,391
4,511,353	4,542,972	4,553,225	4,562,004
4,511,632	4,543,491	4,553,308	4,562,239
4,515,977	4,543,546	4,554,101	4,562,425
4,516,812	4,543,647	4,554,174	
4,517,525	4,544,956	4,554,424	
4,526,153	4,545,161	4,554,497	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 1, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-15-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-11-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	4-15-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	7-26-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-07-85

Expiration of patents: The patents within the range of numbers indicated below expire during February 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,425,060 to 3,426,359, inclusive

Plant Patents ..... Numbers 2,861 to 2,869 inclusive

REEXAMINATIONS

MARCH 18, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,077,328 (473rd)

ROTARY DUMP

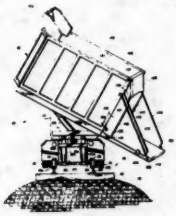
Glenn Taylor, P.O. Box 93006 Martech Station, Atlanta, Ga. 30318

Reexamination Request No. 90/000,644, Oct. 4, 1984.

Reexamination Certificate for Patent No. 4,077,328, issued Mar. 7, 1978, Ser. No. 694,925, Jun. 11, 1976.

Int. Cl.[4] **B61D** *7/10, 9/04, 9/12;* **B61F** *13/00;* **B60P** *1/30*

U.S. Cl. 105—261 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 6–8 and 10 are determined to be patentable as amended.

Claims 2–5 and 9 dependent on an amended claim are determined to be patentable.

1. A load carrying vehicle comprising a framework, road wheels mounted on said framework for supporting said framework from a road surface, railroad wheels mounted on said framework and movable up and down with respect to said framework for engaging the rails of a railroad and supporting said framework from a railroad, a load carrying dump body mounted on said framework, means for tilting said load carrying dump body about an approximately horizontal axis and dumping the load from said dump body, means for rotating said load carrying dump body about an approximately vertical axis for dumping the load from said dump body at various positions about the vehicle, said load carrying dump body comprising a bottom pan, sidewalls extending upwardly on opposite sides of said bottom pan and a front wall extending upwardly from said bottom pan defining an upper opening and a dump opening, a tail gate hingedly connected at its upper edge portion about an approximately horizontal axis to the upper portions of said sidewalls at the upper portion of the dump opening and *its lower edge portion being* movable to open and close the dump opening, an apron connected at one of its edge portions to the lower portion of said dump body at the lower edge of the dump opening, and a pair of wing plates each connected at edges of the dump opening *with the lower edge portion of said tail gate movable over said apron and between said wing plates,* [whereby] *said apron and wing plates being constructed so that* when the railroad wheels are engaged with the rails of a railroad *the dump body can be rotated to direct the dump opening toward the side of the rails and the dump body can be tilted and* the load dumped from the dump body can be [directed] *displaced* out [to] *beyond* the side of the rails of the railroad by the apron and wing plates.

REISSUES

MARCH 18, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,092

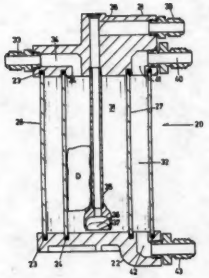
LIQUID MODULATOR

William G. Davis, Houston, Tex., assignor to Liquid Modulators, Inc., Houston, Tex.

Original No. 4,341,092, dated Jul. 27, 1982, Ser. No. 208,542, Nov. 20, 1980. Application for reissue Jul. 27, 1984, Ser. No. 635,000

Int. Cl.[4] F25B *43/04*

U.S. Cl. 62—475 **16 Claims**



3. A receiver/drier for a compression refrigeration system having a compressor, evaporator, condenser and expansion valve,

said receiver/drier being adapted to be connected between said condenser and said expansion valve, and comprising

a hollow body,

end caps closing said hollow body,

the upper one of said end caps having an inlet for connection to said condenser to receive liquified refrigerant therefrom, and an outlet for connection to said expansion valve for discharge of liquified refrigerant thereto for expansion and vaporization in said evaporator,

the lower one of said caps comprising a bottom closure without openings,

an outlet tube secured in said outlet and extending through said hollow body with an open end adjacent to said lower closed end cap,

means supporting a dessicant material inside said hollow body in the space around said outlet tube to absorb moisture in the liquid refrigerant passing therethrough,

an outer casing surrounding and sealed to said hollow body in spaced relation thereto to define an annular chamber in heat exchange relation with said hollow body,

an inlet in a wall of said outer casing for connection to the outlet side of said evaporator to receive cold, expanded refrigerant fluid therefrom,

an outlet in a wall of said outer casing for connection to the inlet side of said compressor, whereby hot, high pressure refrigerant liquid and cold, refrigerant gas are conducted in heat exchange relation through said hollow body and said annular chamber, respectively.

Re. 32,093

ALUMINUM OXIDE COATED TITANIUM-CONTAINING CEMENTED CARBIDE PRODUCT

Thomas E. Hale, Warren, Mich., assignor to General Electric Company, Hudson Falls, N.Y.

Original No. 3,736,107, dated May 29, 1973, Ser. No. 147,240, May 26, 1971. Continuation of Ser. No. 909,699, May 25, 1978, abandoned, which is a division of Ser. No. 577,584, May 15, 1975. Application for reissue Apr. 9, 1984, Ser. No. 597,582

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—336 **32 Claims**

1. A high strength, high-wear resistance coated cemented carbide product comprising:

a *titanium carbide-containing* cemented carbide substrate, and a *generally* fully dense *chemically vapor deposited* alpha aluminum oxide coating of from 1–20 microns thickness firmly and adherently bonded to said cemented carbide substrate through an intermediate layer *comprising:*

another non-metallic compound formed in situ by chemical vapor reaction, which acts to bond said coating to said substrate,

said coated cemented carbide product having a wear resistance substantially equivalent to aluminum oxide base cutting materials and having a transverse rupture strength of at least 150,000 p.s.i.

PLANT PATENTS

GRANTED MARCH 18, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,690

MINIATURE ROSE PLANT-SCHOBITET VARIETY

Earnest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jul. 25, 1984, Ser. No. 634,367
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of Miniature rose plant, substantially as illustrated and described, having the following combination of characteristics:

(a) a vigorous growth habit which forms a well-balanced, well-branched plant which commonly attains a height of less than 60 cm. and has semi-glossy foliage which exhibits a greater than usual disease resistance,

(b) produces fully double, well-formed flowers of clear yellow coloration, fading eventually to pale lemon yellow coloration, which are of good substance and which are produced in abundance, and

(c) has an ability to be used either as a fully hardy outdoor garden rose, or to be forced into bloom in a greenhouse as a flowering pot plant.

5,691

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 24, 1984, Ser. No. 653,350
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by unusual spinel red flowers which are a combination of spinel red tones and are displayed against glossy green foliage.

5,692

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 24, 1984, Ser. No. 653,351
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright red flowers of exhibition form and medium to heavy petalage with outer petals reflexing sharply upon opening and good color stability.

5,693

HYBRID TEA ROSE PLANT CV. AROLALA

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 25, 1984, Ser. No. 624,511
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized by the blended lavender coloration of its flowers, essentially as described and illustrated herein; its abundant production of large, well-formed flowers on strong stems suitable for cutting; its vigorous growth; its attractive bush of medium height and upright habit; its abundance of deep green foliage; and its heavy petal substance that holds up well in varying climates.

5,694

ROSE PLANT—MEIROPE VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 19, 1984, Ser. No. 622,122
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—16 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the fact that:

(a) from the physical point of view, the plant has bronze green adult wood, an upright growth habit, and forms attractive double blossoms which are intense orange on the inner surfaces with the outer surfaces of the petals being orange fading to orange blended with pink, and

(b) from a biological point of view the plant has vigorous vegetation, flowers abundantly and continuously when grown under greenhouse conditions, and exhibits good resistance to diseases,

substantially as herein shown and described.

5,695

CHRYSANTHEMUM PLANT NAMED STARGAZER

Harry G. Tremaine, 13755 N. Wells La., Lodi, Calif. 95240, and Mary L. Hughes, 2320 Wagner Heights Rd., Stockton, Calif. 95209

Filed May 24, 1984, Ser. No. 613,733
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Stargazer, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; red-purple ray floret color; diameter across face of capitulum ranging from 5 to 6.5 cm. at maturity, uniform seven week flowering response; short plant height; spreading branching pattern; average natural season flowering date of September 20, and uniform response with durable color and form in Spring for small pot flowering programs.

5,696

ANTHURIUM PLANT NAMED AMAZONE

Dirk van der Laarse, Aalsmeer, Netherlands, assignor to Anthurium Amazone Limited, Guernsey, Channel Islands

Filed May 24, 1984, Ser. No. 613,407
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct anthurium plant named Amazone, as described and illustrated, particularly characterized by its long and relatively narrow leaves, generally round and very large spathes, red in color, carried on long stalks, and by its spadix which initially are curled and thereafter become generally straight and relatively long, and further characterized by continuously flowering.

PATENTS

GRANTED MAR. 18, 1986

ERRATA

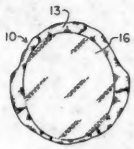
For CLASS	See PATENT NO.
623–006	4,575,877
623–006	4,575,878
225–104	4,576,380
558–037	4,576,760
427–288	4,576,801

PATENTS

GRANTED MARCH 18, 1986

GENERAL AND MECHANICAL

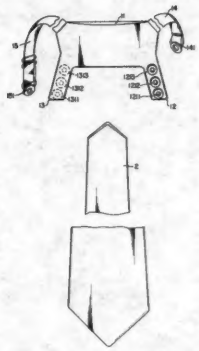
4,575,871
HELMET LINER FOR CONTAINING WATER
Steven L. Auerbach, Fayetteville, N.C., and Sharon J. Conklin, 5434 Wichita Dr., Apt. K-2, Fayetteville, N.C. 28303, assignors to Sharon J. Conklin, Fayetteville, N.C.
Filed Apr. 21, 1983, Ser. No. 487,106
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—6 **8 Claims**



1. An improved helmet and liner combination for containing water or the like, said helmet comprising:
a rigid impact resistant shell, said shell having sides with a terminal rim, said liner comprising:
a flexible water impermeable bag-like member, said bag-like member removably positionable within said shell, said bag-like member having an open end, retaining means, said retaining means attached to said open end of said bag-like member, said bag-like member sized to extend beyond said rim when positioned within said shell for maintaining said open end of said bag-like member over the rim and against the sides of said shell whereby said shell will firmly support said bag-like member during the containment of water.

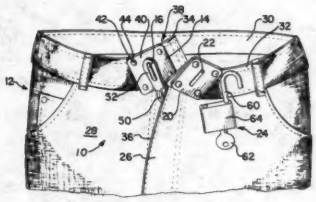
4,575,872
NECKTIE
Cheng C. Chen, 3Fl. 79, Chi Lin Rd., Taipei, Taiwan
Filed Apr. 16, 1985, Ser. No. 723,867
Int. Cl.[4] A41D *25/02*
U.S. Cl. 2—144 **2 Claims**

1. Improved structure of the necktie, characterised in the provision of an interim gap on the upper side of the cravat thereof to permit passage of the strap tongue thereof; also of a snatch lap on either corner on the base of the cravat, one such snatch lap provided with a row of button on the frontal side, the other lap provided with a row of counterbutton on the backside by symmetry, such that both laps can be brought together by twisting altogether in the same direction; also of a fastening belt attached to either corner on the upper side of the cravat, one such belt provided with a button on the free end, the other such belt provided with a counterbutton on the free



end, altogether serving to hold the necktie in position when worn by the user around the nape.

4,575,873
PANTS CLOSURE
James R. Smith, 5535 Blaine, SE., Grand Rapids, Mich. 49508
Filed Nov. 5, 1984, Ser. No. 668,152
Int. Cl.[4] A41D *1/06, 1/14*
U.S. Cl. 2—234 **15 Claims**



1. In a pair of pants, the combination of a pair of flaps, one of the flaps overlapping the other flap to form an overlapping flap and an underlapping flap, a pair of slide fastener elements, one secured to one flap and the other secured to the other flap, a means for joining the slide fastener elements, and a pants closure securely fastened to the pants for fastening the flaps together, wherein the pants closure comprises:
a first plate;
a retaining clasp securely fastened to and projecting from the first plate;
a means securely fastening the first plate to the underlapping flap;
a means joining the slide fastener elements and having a first hole adapted to receive the retaining clasp therethrough;
a second plate having a second hole adapted to receive the retaining clasp therethrough;
a means securely fastening the second plate to the overlapping flap so that the second plate overlaps the first plate with the retaining clasp in registry with the second hole when the flaps are closed;
a locking means engaging the retaining clasp for securing the first and second plates in an overlapping position;

whereby the pants are secured in a closed position with the slide fastener element joining means securely locked in a sandwiched position between the overlapping first and second plates.

4,575,874

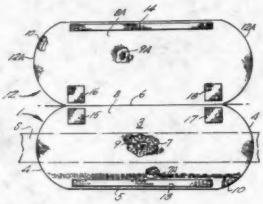
PAD FOR A SHOULDER STRAP

William M. Johnson, P.O. Box 70404, Eugene, Oreg. 97401

Filed Feb. 19, 1985, Ser. No. 702,787

Int. Cl.[4] A41D *27/26, 13/00*

U.S. Cl. 2—268 **9 Claims**



1. A pad for cushioning strap exerted loads on the shoulder of a human body, said pad comprising in combination,

an elongate base member including a cushion component,

a positionable member integral with said base member for superimposition on said base member upon movement of the positionable member about a fold line, and

fabric closure material in place on marginal areas of said base member and said positionable member adapted for engagement upon movement of the positionable member about the pad fold line, said strap confined against lateral displacement by said fabric closure material.

4,575,875

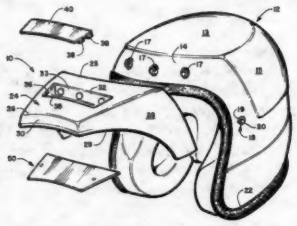
DETACHABLE VISOR FOR A MOTORCYCLE HELMET

Chris R. Dawson, San Diego, Calif.; John Dondero, Sun Valley, Id., and Gerald R. Parks, Chula Vista, Calif., assignors to John R. Gregory, Chula Vista, Calif.

Filed Jun. 18, 1984, Ser. No. 621,707

Int. Cl.[4] A42B *3/02;* **A61F** *9/04*

U.S. Cl. 2—422 **5 Claims**



1. A detachable visor for a motorcycle helmet having snap fasteners on its frontal surface comprising:

a main body having a wedge-shaped side profile and including a top wall shaped and dimensioned to meet the frontal surface of the helmet above said snap fasteners;

laterally spaced side wall members that extend downwardly from the lateral edges of said top wall, said top wall having a front edge and a rear edge;

a laterally extending recess portion is formed in said top wall intermediate its front edge and its rear edge, said recess portion having a downwardly extending rear wall and a pair of laterally spaced downwardly extending side walls, said rear wall being shaped to conform with the frontal surface of the helmet mounting said fasteners and having a plurality of snap fasteners designed and positioned so that they mate with the snap fasteners that are secured to the frontal surface of the motorcycle helmet; and

an air flow detector panel that extends between said side wall members and is attached to the underside of said visor, said air flow deflector panel extends rearwardly a predetermined distance from the front of said top wall.

4,575,876

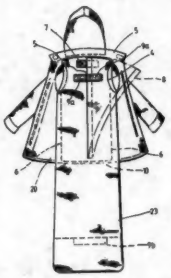
JACKET WITH SLEEPING BAG

David C. Weaver, 1321 E. Nevada St., El Paso, Tex. 79902

Filed Nov. 26, 1984, Ser. No. 674,968

Int. Cl.[4] A41B *1/12*

U.S. Cl. 2—69.5 **6 Claims**



1. Outdoor apparel comprising:

(a) a garment for covering at least a portion of the human torso, the garment having a back panel, front panels, and two arm receiving passages;

(b) a liner attached to the garment adapted to enclose the human figure; said liner comprising a back section and a front section defining a first opening at the nape and two arm receiving regions; an areal portion of the back section of said, liner overlying and joined to said back panel of said garment; the remaining portions of said liner being foldable to fit against said front section of said liner and within an area defined by said back panel of said garment; and

(c) a first closure device to releasably hold said folded portions of said liner against the front section of said liner and within said back panel of said garment.

4,575,877

INTRAOCULAR LENS HAVING LOOPS DEFINING A POSTERIOR CAPSULE BARRIER

Robert S. Herrick, 1255 Via Del Rey, South Pasadena, Calif. 91030

Filed Aug. 4, 1983, Ser. No. 520,455

Int. Cl.[4] A61F *1/16, 1/24*

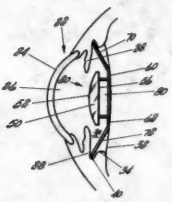
U.S. Cl. 623—6 **17 Claims**

14. An intraocular lens adapted for implantation in the posterior chamber of an eye after extracapsular cataract extraction or intracapsular cataract extraction comprising

a lens body;

a plurality of pliable loops each having a mounting end which terminates in a protruberant member which is affixed to and extends a predetermined distance from the lens body and which at a predetermined point terminates at an opposite end thereof in a supporting end which commences an angular disposition having a substantially acute angle relative to the plane of said mounting end, said supporting end commencing its angular disposition relative to the mounting end at a point which is located substantially circumferential of the lens body, said mounting ends of said plurality of pliable loops having the protrub-

erant members affixed posteriorly to the lens body at selected locations with said predetermined points located at approximately the outer peripheral edge of the lens body wherein each of the mounting ends are positioned



relative to each other to define a generally planar posterior capsule barrier which is adapted to be positioned contiguous to and to slightly stretch the posterior capsule of an eye while defining a space between the lens body and the posterior capsule

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4,575,878

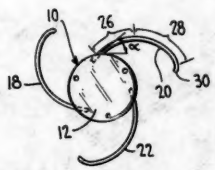
INTRAOCULAR LENSES

Seymour Dubroff, 3806 Thornapple, Chevy Chase, Md. 20815

Continuation-in-part of Ser. No. 230,279, Jan. 30, 1981, abandoned. This application May 13, 1983, Ser. No. 494,364

Int. Cl.[4] A61F *1/16, 1/24*

U.S. Cl. 623—6 **10 Claims**



1. An intraocular lens for implant in an eye comprising

a lens body; and

a plurality of three or more flexible, resilient, fixation filaments extending from the periphery of said lens body to a free end, each of said fixation filaments having a proximal portion secured to said lens body, an intermediate curved portion extending from said proximal portion having a radius of curvature of from 4.5 mm to 6.0 mm and continuing in an arc of from 50° to 65°, and a distal curved portion extending from said intermediate curved portion to said free end having a radius of curvature of from 2.5 mm to 4.0 mm and continuing in an arc of from 75° to 95°.

4,575,879

SAFETY SEAT CLOSURE

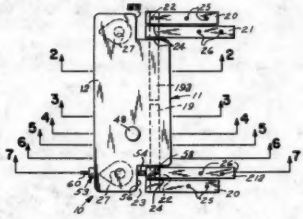
Chavelo Cabral, 1144 Brannick, Los Angeles, Calif. 90023; Donald E. Dean, 565 W. 5th St., San Pedro, Calif. 90731, and Armando M. Lopez, 4373 Telegraph Rd., Los Angeles, Calif. 90023

Filed Oct. 5, 1983, Ser. No. 539,150

Int. Cl.[4] A47K *13/10*

U.S. Cl. 4—253 **1 Claim**

1. A safety seat closure for a toilet commode, comprising, in combination, a hollow housing for being mounted on top a rear portion of said toilet commode, a lid on a top of said housing, a pair of aligned shafts supported between said housing and said lid, one end of each said shaft protruding outward from opposit sides of said housing, a pair of lever arms affixed to each said shaft protruding end, a first arm of said pair being attached to a toilet seat and a second of said pair being attached to a seat lid; an interior on a first of said shafts engaging a detent to hold said seat in opened position, a crank on a second of said shafts being attached to a piston rod of a piston in air an bleed cylinder for damping a speed to pivot said seat or lid toward a closed position, an interior locking arm on said second shaft bearing against a spring-biased stem of an externally extending button when locking said lid in closed position, means to manually push said button rearwardly to unlock said



lid, an interior arm on said second shaft attached to a tension coiled return spring to move said lid to a closed position, and a plunger assembly in said housing, comprising a spring-biased lock pin, one end of said lock pin being attached to an exterior trip wire connected to a flush arm of a toilet water tank or the like, and an opposite end of said lock pin bearing against a rounded pivot end of one of said second lever arms attached to said seat lid, and a notch along said rounded end being engaged by said lock pin opposite end when said seat is lifted.

4,575,880

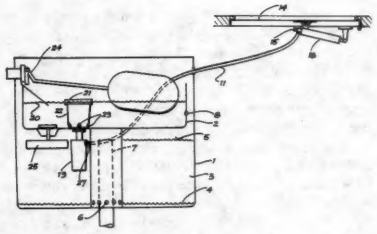
AUTO-FLUSH SYSTEM

Robert H. Burgess, 6 McDonald Crescent, Strathfield, N.S.W., Australia 2135, assignor to Robert Burgess and June Burgess, both of Strathfield, Australia

Filed Jan. 31, 1984, Ser. No. 575,563

Int. Cl.[4] E03D *1/14*

U.S. Cl. 4—313 **12 Claims**



1. In a device for actuating the flushing action of an automatic flush cistern, the cistern having an upper water tank and a lower water tank, a ball-cock controlled water inlet to the upper water tank adapted to fill the upper tank to a predetermined level, a valve-operated orifice in a wall of the upper tank interconecting the tanks, the valve being adapted to open the orifice in response to a predetermined water level in the lower tank, and a syphon device in open communication with the lower tank for emptying the lower tank when the predetermined water level in the lower tank is exceeded, the improvement in the actuating device comprising:

tube means extending through a wall of the upper tank having upper and lower ends extending into said upper and lower tanks, respectively, providing communication between said

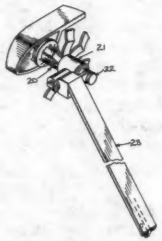
tanks and being adapted to remain filled with water when said lower tank is emptied;
a small bore hole through a sidewall of the upper end portion of said tube means;
a valve seat on said upper end of said tube means;
valve means operatively associated with said valve seat movably mounted around said upper end of said tube means;
a cup shaped member adjacent said lower end of said tube means comprising a base and an upwardly extending peripheral wall portion in surrounding spaced relationship with respect to a lower end portion of said tube means; and
remotely operated means operatively associated with said tube means for raising and unseating said valve means from said valve seat so that said valve means remains unseated until the water in said upper tank empties into said lower tank.

4,575,881

PERPENDICULAR TOILET TRIP LEVER ASSEMBLY

Roy J. Rozek, Plymouth, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 28, 1984, Ser. No. 687,457
Int. Cl.[4] E03D *5/00*
U.S. Cl. 4—405 **9 Claims**



1. A toilet trip lever assembly mountable in a hole in a side wall of a toilet tank, comprising:
a bearing extendable through the hole and having an axial bore therethrough;
retaining means removably connectable to the bearing inside the toilet tank for limiting outward movement of the bearing relative to the hole;
a pivot post extendable radially from the retaining means;
a stem positionable within the bearing for rotational movement therein, the inner end of the stem extendable into the tank and including an offset surface;
a handle connectable to the outer end of the stem which is operable by a user to rotate the stem;
a boom pivotally and directly mounted on the retaining means by the pivot post so as to permit pivoting motion of the boom about the pivot post axis in a plane substantially perpendicular to the tank side wall through which the bearing is extendable; and
an arm affixed to the boom extendable from said boom to said stem offset surface;
whereby rotation of the stem and offset surface can pivot the boom.

4,575,882

INTEGRATED STEREO AND BATHTUB SYSTEM II

Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604

Filed Jan. 18, 1985, Ser. No. 692,827
Int. Cl.[4] A47K *4/00*
U.S. Cl. 4—559 **12 Claims**

1. In a bathtub adapted to contain a liquid medium and provided with an overflow outlet for said liquid in a first upper wall portion of said bathtub, the improvement which comprises:
a second wall portion of said bathtub extending above said overflow outlet; and

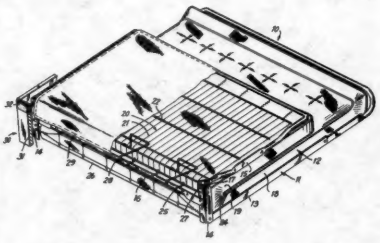
a cavity means formed in said second wall portion of said bathtub adapted to enclose at least one speaker of a sound system.

4,575,883

CONVERTIBLE SOFABED WITH IMPROVED USER COMFORT

Larry D. Powell, Mooreville, and Charles J. Tidwell, Jr., Tupelo, both of Miss., assignors to Mohasco Corporation, Amsterdam, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,720
Int. Cl.[4] A47C *17/13, 17/00*
U.S. Cl. 5—13 **9 Claims**



1. In a sofabed convertible between a bed in its extended condition and a sofa in its collapsed condition and including a frame having a lower frame portion, an upper frame portion, and two upright frame portions interconnecting said lower and upper frame portions at front corners of the sofabed as considered in its collapsed condition, a deck resiliently mounted on the frame portions, a mattress supported on the deck, anda cushion supported on that portion of the deck which is mounted on the upper frame portion in the collapsed condition and having a front edge portion, a combination comprising
a raise tube rigidly connected to the upright frame portions and situated at a considerable distance from the upper regions of the latter as considered in the collapsed condition; and
means for resiliently supporting the front edge portion of the cushion in the collapsed condition ror improving the comfort of the user of the sofabed as a sofa, including
a border wire extending along a substantially U-shaped course and having a main portion extending along the front of the sofabed, and two end portions substantially normal to said main portion and connected to said upper frame portion; and
a plurality of substantially Z-shaped springs each having a first portion connected to said raise tube and a second portion connected to said border wire and operative for resiliently urging said border wire away from said raise tube and for yielding under the forces acting on the front edge portion of the cushion resting on said border wire to keep compression of the material of the cushion at the front edge portion of the

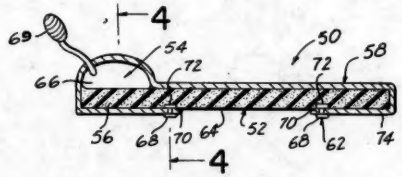
latter within acceptable limits not causing any discomfort to the user sitting on the cushion.

4,575,884

SLEEPING BAG SHEET INSERT

Willis B. Jamerson, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jul. 30, 1984, Ser. No. 636,130
Int. Cl.[4] A47G 9/06, 9/04
U.S. Cl. 5—420 **1 Claim**



1. A sleeping bag sheet insert for fitting within a sleeping bag for preventing the inside of the sleeping bag from becoming soiled, said insert comprising:

(a) a foam rubber sleeping pad with head and feet ends, and top and bottom surfaces;

(b) an inflatable pillow insert placed on the head end of said sleeping pad;

(c) an elongated sheet to cover said sleeping pad and said pillow insert, said sheet being open at the portions of the sides over said pillow insert and having opposite ends which extend over the head and feet ends of the pad to positions underlying and engaging end portions of the top and bottom surfaces;

(d) means for securing said sheet to the underside of said sleeping pad; and

(e) a hand pump connected to side of said inflatable pillow so that when said pillow is in position on said sleeping pad said hand pump can inflate said air chamber manually, wherein said means for securing said sheet to the bottom surface of said sleeping pad are a plurality of male snaps secured to said ends of said sheet and a plurality of female snaps secured to the bottom surface of said sleeping pad to mate with said make snaps when the ends of said sheet are pulled around the head and feet ends of said sleeping pad.

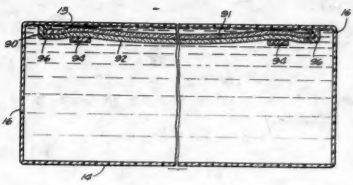
4,575,885

WATERBED MATTRESS WITH FREE FLOATING BAFFLE

Charles P. Hall, Muir Beach, Calif., assignor to Monterey Manufacturing Co., Carson, Calif.

Continuation of Ser. No. 250,888, Apr. 3, 1981, Pat. No. 4,467,485, and a continuation-in-part of Ser. No. 201,304, Oct. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 95,214, Nov. 19, 1979, Pat. No. 4,345,348, which is a continuation-in-part of Ser. No. 949,963, Oct. 10, 1978, Pat. No. 4,247,962. This application May 25, 1984, Ser. No. 613,979
The portion of the term of this patent subsequent to Feb. 3, 1999, has been disclaimed.
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—450 **28 Claims**

1. In a waterbed mattress having an enclosing structure comprising a horizontally extending top wall, a horizontally extending bottom wall, and side walls, the improvement comprising a horizontally extending baffle structure for reducing wave-like motion of water in the mattress disposed within the enclosing structure comprising at least one baffle element, the baffle element having a horizontal extent corresponding generally to the sleeping surface of the mattress, and being unattached to the enclosing structure and comprising a porous mass of bound-together fibers denser than water and means for floating the mass of fibers vertically spaced apart from the bottom wall when the mattress is filled with water, the baffle



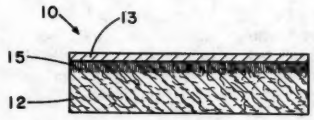
permitting water to circulate between the top wall and the bottom wall.

4,575,886

FIBEROUS WAVE-DAMPENING APPARATUS

Lynn D. Larson, 6051 Park Crest, Lincoln, Nebr. 68506

Filed Jan. 18, 1982, Ser. No. 339,906
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—450 **3 Claims**



1. In combination with a waterbed mattress bladder, a wave-dampening apparatus, comprising

a flexible fibrous member positioned within and filling a substantial portion of the waterbed mattress bladder, said fibrous member having an upper surface and a lower surface and

a foam member comprising a flexible sheet of a buoyant foam material,

said foam member being operably attached to said upper surface of said fibrous member by foam penetration of said fibrous member by said foam member,

said foam member substantially covering the upper surface of said fibrous member,

the horizontal dimensions of said wave-dampening apparatus being similar to but less than the horizontal dimensions of the mattress bladder whereby the buoyancy of said foam member tends to maintain the orientation of said dampening apparatus relative to said bladder.

4,575,887

METHOD FOR ABRADING FABRIC GARMENTS

Julio C. Viramontes, 1057 Eastside Rd., El Paso, Tex. 79915

Filed Aug. 29, 1984, Ser. No. 645,909
Int. Cl.[4] D06F 21/04
U.S. Cl. 8—158 **9 Claims**

1. A method of abrading garments in a conventional household or commercial automatic washing machine which comprises the steps of:

a. placing said garments in a receptacle of said machine capable of agitation of said garments within said receptacle;

b. adding a predetermined amount of abrasive particles to said receptacle, said particles being less than 2 millimeters in diameter, said predetermined amount of particles sufficient to uniformly abrade said garments;

c. further adding to said receptacle a first liquid sufficient to circulate said abrasive particles within said receptacle;

d. agitating of said garments until said garments are uniformly abraded;

e. draining said receptacle through said machine's conven-

tional drainage system of substantially all of said first liquid and said abrasive particles;

f. removing said uniformly abraded garments from said receptacle.

4,575,888

THREAD CUTTING INSERT

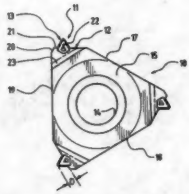
Sture Murén, Gävle, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Feb. 14, 1984, Ser. No. 580,015

Claims priority, application Sweden, Mar. 15, 1983, 8301396

Int. Cl.[4] B26B *9/02*

U.S. Cl. 10—101 R 12 Claims



1. A thread cutting insert comprising a flat wafer of cutting material of generally triangular form and comprising:

an upper face, and a lower face situated opposite and generally parallel to said upper face, and

a plurality of side walls disposed between said upper and lower faces, with the juncture between a pair of said side walls defining an outwardly projecting cutting corner which is recessed downwardly with respect to said upper face, said cutting corner including

a pair of cutting edges which converge outwardly and meet to form a nose and define a maximum feed depth for the insert, and

an upper surface disposed inwardly of said cutting edges, said upper surface comprising

a pair of lands disposed immediately inwardly of respective ones of said cutting edges,

a first chipforming surface which defines a positive rake angle and extends downwardly and inwardly from said lands to a location which is disposed between said cutting edges and spaced inwardly from said nose by a distance of at least one-half of said maximum feed depth, and

a second chipforming surface spaced inwardly of said first chipforming surface and extending upwardly to said upper face.

4,575,889

APPARATUS FOR LASTING SHOE UPPERS OR SHOES ONTO SHOE LASTS

Hermann Roseland, Langwedel-Etelsen, and Manfred Bark, Oyten, both of Fed. Rep. of Germany, assignors to Kloeckner Ferromatik Desma GmbH, Achim, Fed. Rep. of Germany

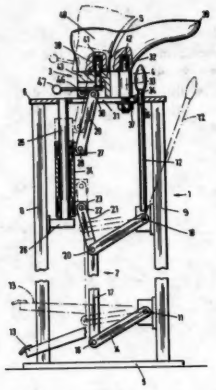
Filed Jan. 28, 1985, Ser. No. 695,282

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403181

Int. Cl.[4] A43D *3/10, 3/00*

U.S. Cl. 12—15 16 Claims

1. An apparatus for the lasting of shoe uppers and shoes onto shoe lasts, and for the removal of the completed shoes from the shoe lasts, comprising a frame, a least one two-part shoe last on an upper surface of said frame, said shoe last comprising a front toe part and a heel part, a fixing device for removably mounting said front toe part on said frame, and a coupling device for movably and releasably mounting said heel part on said frame, said coupling device including pivotable means for releasably mounting said heel part, and height-adjustable means for moving said heel part from a rest position upwardly away from said



frame and toward said front toe part, and back to said rest position.

4,575,890

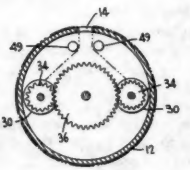
LINT REMOVAL DEVICE

Jerry Hidle, Panama City, Fla., assignor to Panhandle Industries, Inc., Panama City, Fla.

Filed Jun. 5, 1984, Ser. No. 617,529

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—104 A 8 Claims



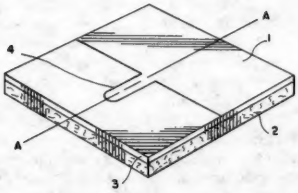
1. A device adapted for removal of lint from textiles, comprising, a cylinder having at least one longitudinal slot in the wall thereof and having end walls, a coaxial shaft extending through one of said end walls for supporting said cylinder for rotation about the central axis of said shaft, a pair of spaced rolls lying parallel to and radially spaced from said shaft, said rolls extending between said end walls and being mounted thereon for rotation about the central axis of said shaft together with said cylinder, and said rolls being mounted on said end walls for rotation about the respective axes of said rolls, a web of material having a tacky, lint removable, outer surface being stored on one of said rolls, being taken-up on the other of said rolls, extending through said slot, and having a portion overlying said cylinder wall, one end of said shaft comprising a handle extending outwardly of said one end wall, whereby lint may be removed from textiles upon manually rolling said cylinder thereover, means rotatable about said central axis in rotary engagement with at least said other roll, said shaft being shiftable along said central axis thereof from an initial position to a second position, and means on said shaft selectively engageable with said rotatable means in said second position for selectively coupling said other roll with said shaft for rotation of said other roll about said roll axis thereof upon manual rotation of said shaft about said shaft axis, whereby said web is taken-up on said other roll for advancing another portion of said web from said one roll to overlie said cylinder wall.

4,575,891

TOILET SEAT DISINFECTANT WIPE

Mark Valente, 4301 - 13th Ave. N., St. Petersburg, Fla. 33713

Filed Nov. 9, 1984, Ser. No. 670,258
Int. Cl.[4] A47K 7/03
U.S. Cl. 15—104.93 6 Claims



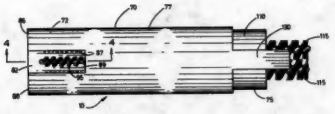
1. A disposable toilet seat wipe comprising a small non-abrasive absorbent pad moistened with an antiseptic solution and a thin, overlay protective means, said means having associated therewith a raisable thumb tab which can be raised to provide a handhold for manipulating said wipe over the outer surface of the toilet seat thereby disinfecting the toilet seat, said wipe being biodegradable and decomposable in water to the extent that the wipe will flush away in the toilet without damage thereto.

4,575,892

DEVICE FOR CLEANING ELECTRICAL CONNECTORS

Gerald W. Ross, Tulare, Calif., assignor to Norman R. Ross, Tulare, Calif., a part interest

Filed Oct. 1, 1984, Ser. No. 656,549
Int. Cl.[4] A46B 3/18, 7/00
U.S. Cl. 15—106 6 Claims



1. A device for cleaning electrical connectors of the type having a female connector and a male connector dimensioned releasably to be disposed in mating relation and wherein the female connector has a body mounting an external elongated boss and having a plurality of elongated bores extending therewithin in substantially parallel relation in a predetermined pattern and wherein the male connector has a housing bounding a chamber dimensioned to receive a portion of the body of the female connector and having a slot dimensioned to receive said boss of the body of the female connector, and a plurality of rod-like terminals spaced from each other within the housing of the male connector in a pattern substantially conforming to said predetermined pattern of the bores of the body of the female connector and each terrminal is dimensioned for individual receipt within one of said bores when the body of the female connector is received within said chamber of the male connector, and said housing mounting a cover pivotal between a closed attitude wherein the cover is disposed in covering relation to said chamber and an opened attitude wherein the cover is pivoted from the chamber, the device comprising:

an elongated intermediate portion having spaced, opposite ends;

a female cleaning portion borne on a first opposite end of the intermediate portion and having a substantially cylindrical wall bounding a cavity dimensioned to receive a portion of the body of a female connector therein, said wall having a slot dimensioned to receive said boss of the body of the female connector when said portion of the body is received within said cavity, and a plurality of elongated brushes mounted within said cavity in a pattern substantially conforming to said predetermined pattern of the bores of the body of the female connector for substantially simultaneous individual receipt in a plurality of the bores of the body of the female connector when said body is received within the cavity for abrasively cleaning said bores upon reciprocal movement of the device during said receipt; and

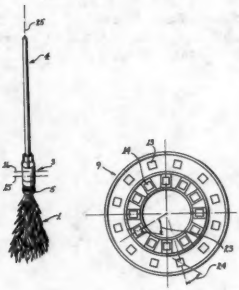
a male cleaning portion borne on a second opposite end of the intermediate portion and having a plurality of elongated brushes each being disposed in juxtaposition to at least one other of said brushes to define an interface area and said interface areas disposed in a pattern substantially conforming to said pattern of the rod-like terminals for engagement of the brushes defining the interface areas with the rod-like terminals for abrasively cleaning said rod-like terminals upon reciprocal movement of the device during said engagement.

4,575,893

BROOM WITH FIXI[illegible] DEVICE FOR HOLDING BUNDLES O[illegible] LASTIC BRANCHES

Henry Rozier, Villa Les [illegible]rives, Le Monteillier, Saint Didier au Mont d'Or, Rhône, France

Filed Jan. 30, 1984, Ser. No. 575,441
Claims priority, application France, Feb. 2, 1983, 83 01908
Int. Cl.[4] A46B 3/10
U.S. Cl. 15—171 5 Claims



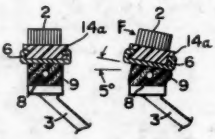
1. A broom comprising a main sheath made of plastic material locked around a handle and equipped with a series of peripheral housings used to hold stems of twigs and branches of bundles made of plastic, said main sheath being covered by a threaded, bell-shaped outer sheath, said housings for the ends of said bundles being arranged around said main sheath following at least two coaxial circumferences of different diameters located on planes and staggered along the geometric axis of said handle to which said two planes are at right angles, each housing having a female part of a locking device, each bundle having a male part of said locking device on the upper extremity of each bundle, each bundle having a tip at a top end which is part of said male part and is split lengthwise, said tip having a substantially square cross-section, said split end being surmounted by at least one swollen knob, each housing on said main sheath having a cross-section which is substantially square in order to enable said housings to receive said male parts of said bundles and to allow each of said bundles located at one of said circumferences to be oriented at approximately the same angle with respect to a corresponding one of each of said bundles located at another of said circumferences.

4,575,894

VERTICAL ACTION TOOTH BRUSH

Joy Stevens, P.O. Box 26284, Honolulu, Hi. 96825, and George T. Hemmeter, 4125 Black Point Rd., Honolulu, Hi. 96816

Filed Nov. 2, 1984, Ser. No. 667,570
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—172 2 Claims



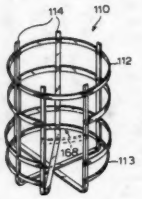
1. In a toothbrush intended for brushing action substantially in both directions of the major axis of the teeth being cleansed, said toothbrush having an elongated handle supporting at one end of its extremity a mounting platform, said platform having an axle placed at right angles to the major axis of said handle, pivotally mounted on said axle, for limited angular turning movement thereon is a bristle brush-holder, a resilient means is provided between said mounting platform and said brush-holder to allow restrictive turning movement of the brush-holder on said axle with respect to the mounting platform, both said mounting platform and said bristle brush-holder being mounted to make an obtuse angle with respect to said major axis of the handle.

4,575,895

REFUSE BAG FRAME FOR VACUUM CLEANERS

Stanley Spellman, 75 Cedar Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 613,076, May 22, 1984, Pat. No. 4,531,258. This application Feb. 20, 1985, Ser. No. 703,390
Int. Cl.[4] A47L *5/08*
U.S. Cl. 15—327 R 9 Claims



1. A refuse bag frame for supporting a refuse bag in a vacuum cleaner, said vacuum cleaner having a cylindrical bin lined by said refuse bag, a cover for the cylindrical bin including a vacuum blower, the rim of the the open end of the refuse bag being clamped between the rim of the cylindrical bin and the cover, and a collection inlet extending through the sidewall of said cylindrical bin, said refuse bag frome comprising:

(a) at least one horizontal, band-like, flat hoop having a diameter substantially equal to the internal diameter of said cylindrical bin disposed at the upper region of said refuse bag frame above said collection inlet when said frame is mounted in said vacuum cleaner;

(b) at least one horizontal, band-like, flat, partial hoop having a diameter substantially equal to the internal diameter of said cylindrical bin disposed in the lower region of said refuse bag frame below the collection inlet in the side wall of said cylindrical bin;

(c) a plurality of flat, spaced-apart, rigid, vertical supports, each support having a length substantially equal to the internal height of said cylindrical bin and having vertically spaced-apart pairs of laterally aligned slots, each pair being aligned with corresponding pairs of slots in the other vertical supports, said at least one horizontal hoop being threaded through correspondingly aligned pairs of slots in the upper regions of said vertical supports, and said at least one horizontal, partial hoop being threaded through correspondingly aligned pairs of slots in the lower regions of said vertical supports below the collection inlet in the sidewall of said cylindrical bin when said refuse bag frame is inserted therein, said partial hoop interconnecting all but two adjacent vertical supports thereby resulting in a space therebetween, said space being aligned with said collection inlet in the sidewall of said cylindrical bin; and

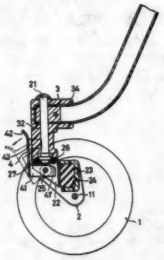
(d) means for securing said at least one hoop and said at least one partial hoop to said plurality of spaced-apart, vertical supports at the connections therebetween to form a cylindrically-shaped frame dimensioned to fit within the refuse bag lining the cylindrical bin of said vacuum cleaner.

4,575,896

CASTER WITH AN OSCILLATION STOPPING MECHANISM

Shinroku Nakao, Kanagawa, and Kunimasa Tsuchiya, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,645
Claims priority, application Japan, Dec. 25, 1980, 55-187072
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—35 R 2 Claims



1. A caster, comprising; a caster body (2), a caster holder (3), and a first rotational axle (21) extending between said caster body and said caster holder and including a base frame (22) at a lower end thereof; said base frame and said caster body jointly receiving a second rotational axle (25) therethrough; a lock clip rotatably supported by said second rotational axle for selectively locking said caster holder and said base frame, said castor body being rotatably mounted with respect to said second rotational axle, and a rubber damper disposed between said caster body and said base frame, said rubber damper being compressible between a front of said base frame and a rear, vertical face of said caster body.

4,575,897

HANDLE ATTACHMENT FOR A HOLLOW ACCESSORY HANDLE WHICH IS FORMED OF SHEET METAL

Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,531
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204641
Int. Cl.[4] A47J *45/10*
U.S. Cl. 16—110 A 9 Claims

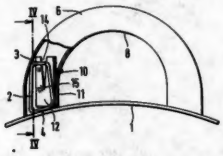
1. A handle apparatus for a dish, comprising:

a support member which is an elongate sheet metal strip bent into a substantially rigid and approximately rectangular

loop, said loop having a first side which is fixedly secured to an external surface of said dish, a second side which projects outwardly from said external surface, and a third side which is opposite said first side thereof and which has a locking recess provided in an edge portion thereof, an outwardly facing side surface of said second side of said loop serving as a first guide surface on said support member, and opposite edge portions of said loop formed from said sheet metal strip which each extend along said second and third sides of said loop respectively serving as second and third guide surfaces on said support member;

a hollow handle part having an opening extending into an end thereof which faces said external surface of said dish, said handle part being formed from a single sheet metal plate which is bent into an approximately annular shape so that opposite edge portions thereof are adjacent;

a guide element which is disposed in said opening in said handle part and which is a single piece of sheet metal bent into a U-shape and having a back wall and two spaced legs, said back wall being fixedly secured to a surface of said sheet metal plate forming said handle part and said guide element being oriented so that said back wall and said legs each



extend substantially parallel to said second side of said support member, said back wall having on an inwardly facing side thereof a first guide surface and said legs respectively having on inwardly facing sides thereof second and third guide surfaces, said support member being slidably received between said legs of said guide element so that said first, second and third guide surfaces on said support member respectively slidably engage said first, second and third guide surfaces on said guide element to thereby prevent movement of said handle part relative to said external surface of said dish in said directions in which said first, second and third guide surfaces on said guide element face and to prevent rotation of said handle part relative to said dish about an axis perpendicular to said external surface of said dish, said guide element further having an elongate, resilient leaf spring element provided on and integral with one of said legs thereof and extending in a direction approximately parallel to said second side of said support member, said resilient spring element engaging said locking recess in said support member and yieldably urging said guide element and said handle part in a direction toward said external surface on said dish.

4,575,898

SEALED BUSHING ASSEMBLY FOR PIVOTAL MEMBERS

Frederick D. Carlson, Burlington, and Ronald E. Hart, Muscatine, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

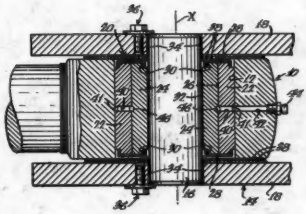
Filed Sep. 19, 1984, Ser. No. 651,883
Int. Cl.[4] E05D *11/02*
U.S. Cl. 16—274 **5 Claims**

1. A bushing assembly for connecting first and second members for relative pivotal movement about an axis, wherein said first member defines an opening within which said assembly is positionable, and said second member comprises a pin extending through said bushing assembly, said assembly comprising:

first bushing means positioned within said opening and secured to said first member;

second bushing means positioned coaxially within said first bushing means to define an annular bushing interface therewith, said second bushing means defining another opening through which said pin of said second member extends, said second bushing means being secured to said pin, whereby said first and second bushing means are relatively rotatable about said axis attendant to relative pivotal movement of said first and second members;

means for retaining said second bushing means in position within said first bushing means comprising a pair of annular end caps fitted to respective opposite ends of said first



and second bushing means, said end caps being secured to one of said first and second bushing means for rotational movement relative to the other of said first and second bushing means; and

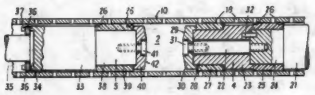
means for lubricating said bushing interface comprising at least one lubricant passage defined by said first bushing means, and an annular lubricant channel communicating with said lubricant passage, said lubricant channel being defined by said first and second bushing means and extending about said bushing interface.

4,575,899

APPARATUS FOR SEVERING THE MEAT FROM BONES

Otto Prosenbauer, Vienna, Austria, assignor to Inject Star Pokelmaschinen GmbH, Vienna

Filed May 22, 1984, Ser. No. 612,825
Claims priority, application Austria, May 27, 1983, 1956/83
Int. Cl.[4] A22C *17/04*
U.S. Cl. 17—1 G **12 Claims**



1. A press for severing meat from bones, comprising:

a cylindrical wall having first and second ends and defining a press cavity, said wall including openings sized to permit the passage of meat and to prevent the passage of bone therethrough;

a press piston adapted to enter said press cavity from the first end by movement in an axial direction of the cylindrical wall, said press piston including:

a first blunt front surface of smaller diameter than the diameter of said press cavity;

a cylindrical section for guiding the piston along said cylindrical wall;

a counter piston adapted to enter said press cavity from the second end by movement in axial direction of the cylindrical wall, said counter piston including:

a second blunt front surface of smaller diameter than the diameter of said press cavity;

a cylindrical section for guiding the piston along said cylindrical wall;

a discharge means for expelling pressed bones from said

press cavity, said discharge means being adapted to be opened and closed by correspondingly moving one of said pistons; and

means carried by the cylindrical section of at least one of said pistons defining an abrading edge for cleaning said openings in said cylindrical wall during each piston stroke.

4,575,900

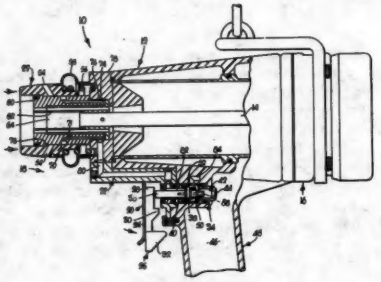
PNEUMATIC STUNNER

Jerome T. Hamel, Shawnee, and Bernard G. Huff, Shawnee Mission, both of Kans., assignors to Hantover, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 484,938, Apr. 14, 1983, Pat. No. 4,503,585. This application Feb. 15, 1985, Ser. No. 702,374

Int. Cl.[4] A22B *3/02*

U.S. Cl. 17—1 B **7 Claims**



1. In a stunner having a housing, a stunning element, means shiftably mounting said stunning element within said housing, said mounting means including fluid pressure operable means for projecting the end of said element from said housing for stunning an animal in response to a change in applied fluid pressure, and fluid pressure actuating means operably coupled to said projecting means, said actuating means comprising:

trigger means connected to said housing for manual shifting from an inoperative position to an operative position;

a first valve operably connected to trigger means for movement from a closed position to an open position as said trigger means is shifted from an inoperative position to an operative position;

an animal contact responsive member carried by said housing and shiftable from an inoperative position to an operative position in response to cooperative engagement with an animal to be stunned;

a second valve operably connected with said contact member for movement from a closed position to an open position as said contact member is shifted from an inoperative position to an operative position;

exhaust means operably coupling said second valve with the atmosphere; and

fluid conduit means operably coupling said first valve and said second valve to said projecting means,

said fluid conduit means also being adapted to be pressurized with air when said second valve is closed,

said projecting means being operable to project said stunning element only in response to shifting both of said trigger means and said contact member to an operative position wherein both said first valve and said second valve are open such that pressurized air within said fluid conduit is exhausted.

4,575,901

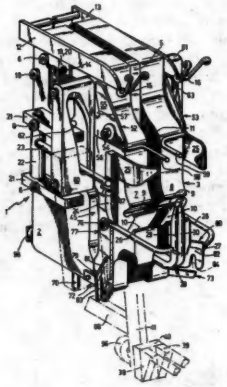
POULTRY HOLDING MECHANISM WITH IMPROVED WING HOOKS

Hershey Lerner, Aurora, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Jan. 20, 1984, Ser. No. 572,455

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—11 **8 Claims**



1. A mechanism for holding slaughtered birds in a poultry cutting machine, comprising,

a support member having a support face which engages and supports a bird while the bird is being cut into pieces,

means for holding the bird at a position where it lies against said support member,

wing hook means comprising a pair of stationary wing hooks and a pair of movable wing hooks, each of said movable wing hooks being supported for movement from an open position spaced from a stationary wing hook to a closed position at which a wing of a bird is held between a movable wing hook and a stantionary wing hook, and

means for moving the movable wing hooks between their open and closed positions.

4,575,902

DEPILATING APPLIANCE

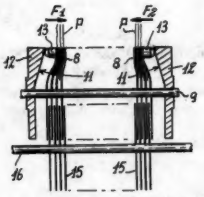
Jean Alazet, Perpignan, France, assignor to Francis Cardus, Paris, France, a part interest

Filed Dec. 12, 1984, Ser. No. 684,360

Claims priority, application France, Dec. 22, 1983, 83 20539

Int. Cl.[4] A45D *26/00*

U.S. Cl. 19—2 **10 Claims**



1. A depilating appliance for plucking hairs to be removed by means of moving elements driven by an electric motor housed within a casing which can be held in one hand, wherein said elements for plucking hairs comprise a series of disks placed in adjacent relation with a small clearance between them and forming a roller unit rotatably mounted behind a slot, a grid or the like provided in one end of the casing and wherein

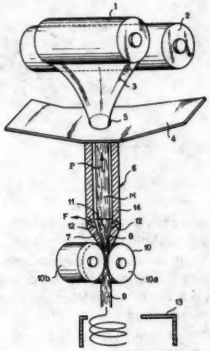
provision is made for means whereby hairs which have engaged between the disks are periodically gripped and clamped against said disks in such a manner as to ensure that said hairs are thus pulled by the disks and plucked-out as a result of rotational displacement of said disks.

4,575,903

DEVICE FOR GUIDING A SLIVER INTO A CAN COILER

Roger Gauvain, Buhl, France, assignor to Societe Alsacienne de Construction de Material Textile, France

Filed Nov. 17, 1983, Ser. No. 552,978
Claims priority, application France, Dec. 13, 1982, 82 20831
Int. Cl.[3] D04H *11/00*; D01H *5/72*
U.S. Cl. 19—159 R **2 Claims**



1. A device located downstream of a high-draft drawing machine and upstream of a can coiler for high-speed transfer of a fiber web which is guided within a guide duct in order to form a sliver which passes at the exit of said duct between takeup rollers of the can coiler, the wall of said guide duct being pierced with at least one air-escape hole which opens to the surrounding atmosphere and makes it possible for the air entrained by the interstices of the fibers to be discharged to the exterior in order to prevent any pressure rise within the guide duct which would otherwise set up an obstacle to the admission of the web of fibers into the entrance of said guide duct, wherein the air-escape hole is inclined from the exterior of the guide duct to the interior in the direction of travel of the sliver.

4,575,904

GUY HOOK

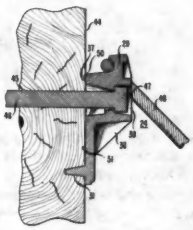
John H. Drewes, Birmingham, Ala., and Richard J. Gemra, Millington, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 21, 1984, Ser. No. 673,585
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—115 K **1 Claim**

1. A guy hook for attachment to transmission line poles comprising

an integrally connected upper body portion, a central body portion and a lower heel portion, said upper body portion having ears and a neck for engaging a guy cable, said central body portion having a substantially vertical frontward face, an opposite rearward surface for receiving a horizontal through-bolt, said heel portion having a rearward pole-engaging surface shaped to conform with the circumference of a transmission line pole and having a plurality of spurs for engaging the fibers of said pole, and means for minimizing the overturning and downslotting of said hook when said hook is attached to the transmission line pole and the guy wire is engaged around said neck, said means comprising

said rearward pole-engaging surface of said central body portion being concavely curved upward and outward to provide an upper edge to bite onto said pole, said rearward pole-engaging surface of said heel portion being dimensioned to be approximately 50 percent of the total vertical height of said hook, and a countersunk recess



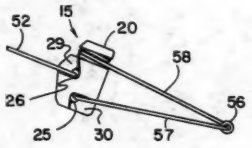
being formed in said frontward face of said central portion around said passageway and dimensioned for receiving and capturing the head of the through-bolt, the bottom countersunk surface of said recess being substantially in the same plane as the vertical line of action of said hook at the point of contact between the guy cable and said neck.

4,575,905

DEVICE OF UNITARY CONSTRUCTION FOR ADJUSTABLY HANGING A PICTURE

Ralph H. Torrey, 3500 Dry Creek Rd., Marietta, Ga. 30062

Filed Nov. 21, 1983, Ser. No. 553,503
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—129 R **7 Claims**



1. A device for securing a mechanical wire connection and adjusting the length of said comprising in combination:

a body;

a cleat member, comprising a shank and a head, extending from said body and characterized by a longitudinal cleat axis;

means defining an elongated opening in said body characterized by an opening axis substantially parallel to said cleat axis;

means defining a cleat hole in said head wherein said opening axis passes through said cleat hole and above said shank;

means defining a pair of holes in said body, each of said pair of holes being characterized by a center, wherein a line connecting said center of each of said pair of holes defines a hole axis;

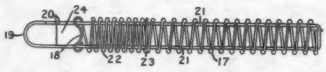
wherein said pair of holes and said cleat member are disposed on said body so that the smaller angle of intersection between said hole axis and a line perpendicular to said cleat axis is greater than 20°.

4,575,906

HOOK FASTENING DEVICE

Walter L. Larsen, P.O. Box 18302, Seattle, Wash. 98118

Filed Apr. 10, 1979, Ser. No. 28,850
Int. Cl.[4] A44B *13/02*; A41D *27/22*
U.S. Cl. 24—238 **66 Claims**



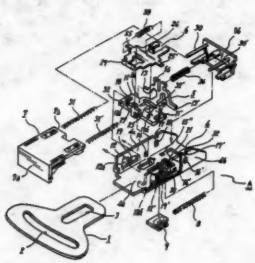
1. A fastening device for fastening a hook to a generally linear member comprising an effectively closed generally loop shaped clip in which the effective length of the loop portion of the clip is extensible and which is so constructed and arranged that it is adapted to occupy a position with respect to the hook and the linear member, when the hook is hooked to the linear member, such that the clip generally contacts the outside surface of the hook at two points, one generally on each side of the position occupied by the linear member, and the loop lies between said two points on a path which generally passes on the side of the linear member which is opposite to the side closest to the inner surface of the hook.

4,575,907

LATCH BUCKLE FOR SEAT BELT

Juichiro Takada, 12-1, 3 chome, Shinmachi, Setagaya-ku, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,656
Claims priority, application Japan, Sep. 12, 1983, 58-140297[U]
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—641 **2 Claims**



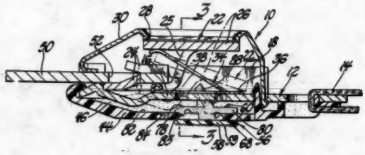
1. A seat belt latch buckle for retaining a buckle tongue in latched position and having a generally U-shaped frame that includes a base and a pair of side walls, a generally L-shaped latch plate pivotably supported in the side walls of the frame by reception of side extensions in generally triangular-shaped holes in the side walls and having a latching portion engageable with the tongue, a spring urging the latch plate to a tongue-latching position, a release member movable parallel to the frame base and engageable with the latch plate to pivot it out of the tongue-latching position to release the tongue, and a tongue ejector member resiliently urged along the frame base to push the released tongue out of the buckle body characterized in that a control member is slidable along the latch plate between a first position in which it engages a portion of the frame and prevents the latch plate from pivoting out of the latching position and a second position free of engagement with the frame to allow pivoting of the latch plate out of the latching position, and in that the release member has a portion engageable with a portion of the control member upon partial movement of the release member toward engagement with the latch plate to move the control member to the second position before moving the latch member to release the tongue.

4,575,908

LOCK FOR SEAT BELT BUCKLE

Lawrence A. Gloomis, Sterling Heights, and Wendy M. Schoof, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 5, 1985, Ser. No. 751,893
Int. Cl.[4] A44B *11/26*
U.S. Cl. 24—650 **3 Claims**



1. A seat belt buckle comprising:

a body;

a latch lever movably mounted on the body and having a locking tang and a pushbutton;

spring means acting between the body and the latch lever to normally establish the latch lever at a position establishing the locking tang in locking engagement with the latch plate, said spring being yieldable to permit the occupant to move the latch lever to an unlatching position by depressing the pushbutton; and

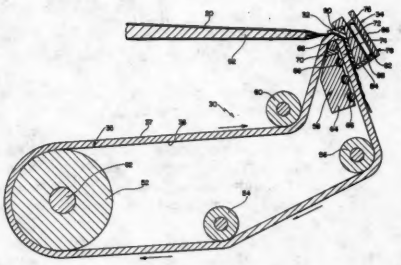
a locking member movably mounted on the body for occupant movement between locking and unlocking positions, said locking member having a locking abutment carried thereby adapted to block the latch lever against movement to the latch plate releasing position when the locking member is moved to its locking position and said locking member being withdrawn away from blocking the latch lever to permit normal unlatching by depression of the pushbutton whenever the locking member is moved to its unlocking position.

4,575,909

APPARATUS FOR TREATING FABRIC FOR SHRINKAGE

Richard W. O'Brien, North Wilkesboro, and Gwyn D. Rogers, Moravian Falls, both of N.C., assignors to Modern Globe, Inc., North Wilkesboro, N.C.

Filed Mar. 7, 1984, Ser. No. 587,269
Int. Cl.[4] D06C *21/00*
U.S. Cl. 26—18.6 **3 Claims**



1. An apparatus for treating an elongated fabric strip for shrinkage and the like comprising a continuously advancing resilient belt having inner and outer surfaces, a roller engaging

the inner surface of said belt and defining a curved area in the extent thereof, said belt having an area of substantially reduced curvature immediately beyond said curved area and having a thickness which is of significant dimension relative to the radius of said roller so that the linear speed of said outer surface in said curved area is significantly greater than the linear speed of said outer surface in said area of reduced curvature, means supporting the inner surface of said belt in said area of reduced curvature, a compression shoe having a low-friction compression surface thereon, said shoe being configured and dimensioned so that said compression surface is receivable in substantially mating relation with said outer surface of said belt in a compression area which extends from an intermediate point in said curved area to a point in said area of reduced curvature which is spaced from said curved area, means for mounting said shoe so that it is disposed in substantially mating relation to said belt outer surface in said compression area and resiliently biased toward said area of reduced curvature, said mounting means comprising a buffer made of a rubberized material, an inflatable member, a backup plate and a retainer wall, said retainer wall extending angularly from said backup plate toward said area of reduced curvature and cooperating with said backup plate to mount said inflatable member and said buffer so that said inflatable member biases said buffer toward said shoe to thereby bias said shoe toward said area of reduced curvature, and means for continuously longitudinally advancing said strip to said belt and said shoe so that substantially said entire strip is received in pressurized engagement between said belt and said shoe and advanced by said belt to a point in the travel thereof which is beyond said shoe.

3. An apparatus for treating an elongated fabric strip for shrinkage and the like comprising a continuously advancing resilient belt having inner and outer surfaces, a roller engaging the inner surface of said belt and defining a curved area in the extent thereof, said belt having an area of substantially reduced curvature immediately beyond said curved area and having a thickness which is of significant dimension relative to the radius of said roller so that the linear speed of said outer surface in said curved area is significantly greater than the linear speed of said outer surface in said area of reduced curvature, means supporting the inner surface of said belt in said area of reduced curvature, a compression shoe having a low-friction compression surface thereon, said shoe being configured and dimensioned so that said compression surface is receivable in substantially mating relation with said outer surface of said belt in a compression area which extends from an intermediate point in said curved area to a point in said area of reduced curvature which is spaced from said curved area, means for mounting said shoe so that it is disposed in substantially mating relation to said belt outer surface in said compression area and resiliently biased toward said area of reduced curvature and also slightly in the direction of travel of said belt, and means for continuously longitudinally advancing said strip to said belt and said shoe so that substantially said entire strip is received in pressurized engagement between said belt and said shoe and advanced by said belt to a point in the travel thereof which is beyond said shoe, said shoe being made of a material which is slightly deformable and being of a sufficient thickness to permit it to deform slightly in the direction of travel of said strip so that the friction between said shoe and said strip as said strip is passed over said curved area causes said shoe to be deformed slightly and thereby drawn into pressurized mating relation with said strip on said belt in said curved area.

4,575,910

METHOD OF TREATING TRACTION SURFACES

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Apr. 11, 1985, Ser. No. 721,992
Int. Cl.⁴ B21H *1/14*
U.S. Cl. 29—148.4 D **2 Claims**

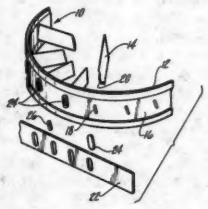
1. A method of treating the traction surfaces of traction roller transmissions having rotatable traction elements, with circular traction surfaces comprising the steps of: supporting the traction elements with their traction surfaces in engagement with one another rotating the traction elements so as to provide traction surface speeds of about 200–750 inch/minute, and applying a load of 3 to 5 times the basic dynamic surface contact design pressure to the traction elements whereby, at surface asperities the surface pressure is amplified and exceeds the yield strength of the traction element surface material, such that the asperities are forced into the traction surfaces and eliminated while any minute surface depressions remain.

4,575,911

METHOD AND APPARATUS FOR CONSTRUCTING TURBINE COMPONENTS

Oliver J. Laszlo, Dearborn, Mich., assignor to Abdite Industries, Inc., Dearborn, Mich.

Filed Feb. 8, 1985, Ser. No. 699,706
Int. Cl.⁴ B21K *3/04*; B23P *15/02, 19/02, 19/08*
U.S. Cl. 29—156.8 B **4 Claims**



1. A method of assembling a turbine blade or the like to a metallic mounting element wherein the blade includes an end tang and the mounting element has a slot-like aperture to receive the end tang therethrough and the end tang is of sufficient depth to project fully through and beyond the mounting element, said method comprising the steps of:

A. placing a strip of composite material adjacent a surface of the mounting element opposite the turbine blade and overlying the aperture;

B. separating out of said strip a section of material larger than the aperture; and

C. driving the tang through the separated section while urging the section into abutting contact with said mounting element surface.

4. Apparatus for assembling turbine blades and mounting bands wherein said blades are of the type having a body and an end tang and said mounting bands are of the type having spaced slots for receiving said end tangs, the apparatus comprising:

means defining a seat for a blade and for receiving said band in an assembly position with said end tang extending through a slot;

retainer means for holding stripstock material from which to form washers for surroundingly engaging said end tangs which protrude through said bands;

punch means for separating washers out of said stripstock and driving said washers onto said protruding end tang portions and flush against the surface of said band to mechanically secure said blade to said band.

4,575,912
SPRING STEEL

Carl E. Grip; Bertil J. Hagstad, and Björn H. Andersson, all of Luleå , Sweden, assignors to SSAB Svenskt Stal AB, Stockholm, Sweden

PCT No. PCT/SE83/00310, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00981, PCT Pub. Date Mar. 15, 1984
PCT Filed Sep. 5, 1983, Ser. No. 610,289
Int. Cl.[4] B23P *13/00*
U.S. Cl. 29—173 2 Claims

1. A method of forming a spring made of a self-tempering, low carbon steel, said method comprising the sequential steps of

(1) providing in a ladle a steel melt which contains, by weight, 0.20–0.40% carbon, 0.20–0.35% silicon, 1.0–1.3% manganese, up to 0.040% sulfur, up to 0.040% phosphorus, up to 0.60% chromium, up to 20 ppm nitrogen, and oxygen,

(2) vacuum treating said steel melt,

(3) adding an amount of aluminum to said steel melt such that the non-combined oxygen therein is reduced to between 15–20 ppm,

(4) adding an amount of titanium to said steel melt such that said steel melt contains 0.020–0.045% by weight titanium, the amount of added titanium being controlled such that the product of the titanium content in the steel melt and the nitrogen content in percent by weight does not exceed 0.0004%,

(5) adding an amount of boron to said steel melt such that said steel melt contains 0.020–0.004% by weight boron,

(6) continuously casting said steel melt in the absence of air to form cast steel,

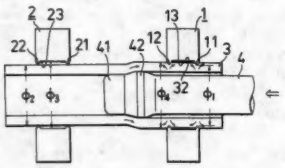
(7) hot rolling said cast steel such that its total cross sectional reduction is not less than 22:1 to form hot rolled steel, and

(8) machining said hot rolled steel into a spring without tempering.

4,575,913
METHOD OF JOINING TUBULAR MEMBER AND ANNULAR PARTS

Toshiyasu Sugiuchi, Tokyo; Susumu Aoyama, Misato, and Toshio Yoshida, Tokyo, all of Japan, assignors to Riken Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,474
Claims priority, application Japan, Jul. 19, 1982, 57-125330
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432 2 Claims

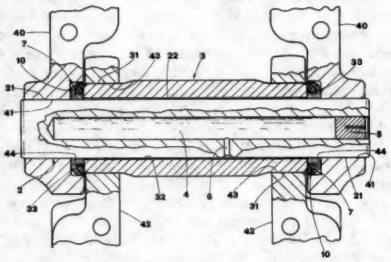


1. A method of joining metallic annular parts to the outer periphery of a separately made metallic tubular member which comprises passing the tubular member through the annular parts each of which has two spaced annular serrated engagement portions around its inner periphery, positioning said tubular member as required in relation to said annular parts, and then expanding said tubular member internally by forcing thereinto a pressing member having a diameter larger than the inner diameter of said tubular member in such a manner that substantially no pressure is exerted on a cylindrical surface between two spaced annular serrated portions on the inner periphery of each of said annular parts while imparting a shearing force and a clamping force to the outer wall of said tubular member to obtain a plastically deformed joint between said tubular member and said annular parts.

4,575,914
ASSEMBLY-PROCEDURE AND RELATIVE HINGE-ASSEMBLY FOR USE WITH LUBRICATED-TYPE CRAWLER TRACKS

Gennaro Armida, Milan; Decio Sacco, Naples, and Walter Grilli, Castelnuovo Rangone, all of Italy, assignors to Italtractor I.T.M. S.p.A., Castelvetro, Italy

Filed Jul. 5, 1983, Ser. No. 510,665
Claims priority, application Italy, Aug. 5, 1982, 40081 A/82
Int. Cl.[4] B23P *11/00;* F16J *15/16;* B62D *55/08;* F16C *17/04*
U.S. Cl. 29—434 7 Claims



1. Hinge-assembly for uniting the links of lubricated crawler tracks, characterized in that it comprises:

a hinge-pin (2), having a smooth cylindrical surface (22), whose two ends (21) are designed for force-fitting into the holes (41) offered by outer respective link bosses;

a sleeve (3) disposed coaxially with and about the central section of said pin (2) and provided with a smooth inner cylindrical surface (32), able thus to rotate with respect to the cylindrical surface (22) of said pin; the breasted surfaces of said pin (2) and said sleeve (3) lubricated by oil from a reservoir located permanently in said hinge-assembly; the two ends (31) of said sleeve (3) designed for force-fitting into the holes (43) offered by inner respective link bosses;

two thrust-rings (7), each of which provided with a smooth inner cylindrical surface (8) and associated coaxially and as one by the latter (8) with surface (22) aforesaid of said pin (2) adjacent to the butt-ends (33) offered by said sleeve (3); each ring (7) furnished with an annular protrusion such as creates a housing directed toward said butt-end (33) of said sleeve (3) and designed to accommodate sealing-means (10); the pairing between ring (7) and pin (2) being such as to prevent the egress of lubricant by way of their respective mating surfaces (8) and (22); the outer link bosses aforesaid each provided with an annular recess designed to receive said thrust-ring (7) whilst making no contact therewith;

sealing-means (10) located coaxially about said hinge-pin (2) and accommodated within the housings created by said annular protrusions/thrust-rings (7), for the purpose of retaining lubricant at the butt-ends (33) of said sleeve (3); the pairing aforementioned between ring (7) and pin (2) also being such as to compress said sealing means (10) to a sufficient degree of pre-loading against the butt-ends (33) of said sleeve (3), thereby checking any egress of lubricant.

2. Method for assembling lubricated crawler track links utilizing the hinge-assembly as claimed in claim 1, comprising, in sequence, the steps of:

a providing said hinge-assembly, including said pin (2), said sleeve (3), said two thrust-rings (7), and said sealing-means (10):

b filling the hinge-pin reservoir with lubricant;

c pausing a sufficient duration to check for oil-leaks from the assembled and lubricated hinge;

d force-fitting the two inner link bosses to the ends (31) of said sleeve (3), by exerting said force from the outsides of said hinge-assembly in a direction toward the centre of same parallel with the pin-axis;

e force-fitting the two outer link bosses to the ends (21) of said pin (2), by exerting said force likewise from the outsides of said hinge-assembly in a direction toward the center of same, parallel with the pin-axis.

4,575,915

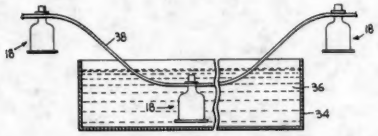
METHOD OF FORMING A COMPOSITE CONTAINER

Richard E. Clark; Louis D. Tacito, both of Merrimack; Bryan H. Miller, Nashua, and Martin H. Beck, Brookline, all of N.H., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Filed Sep. 6, 1983, Ser. No. 529,810

Int. Cl.[4] B21D *39/00*; B29C *49/24*

U.S. Cl. 29—509 **5 Claims**



1. A method of forming a blow molded container of a biaxially orientable resin having a stable base and having an internal barrier coating; said method comprising the steps of blow molding a bottle-like container having an upper end portion including a neck finish for receiving a closure, an intermediate body, and a lower portion including an annular flange at a lower end of said body; severing all of said lower portion, with the exception of said annular flange, from said body to define an open lower end; applying an internal barrier coating to the thus formed container through the body open lower end in a dip coating operation by supporting the container by its neck finish and moving the container down into and then out of a bath of coating liquid; and then applying a separate bottom to said body utilizing said annular flange as a seaming flange to close the body open lower end.

4,575,916

METHOD FOR PREPARING A SEAT BELT BUCKLE MECHANISM

Katsumi Naitoh, Kanagawa, and Tadaaki Shimamura, Saitama, both of Japan, assignors to NSK Warner K.K., Japan

Division of Ser. No. 406,451, Aug. 9, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 710,658

Claims priority, application Japan, Aug. 22, 1981, 56-124433[U]

Int. Cl.[4] B21D *39/00*; B23P *11/00*

U.S. Cl. 29—517 **5 Claims**

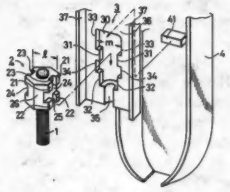
1. A method for preparing a buckle mechanism comprising;

forming a circumferential cut-out on a cylindrical tubular metal member;

compressing said tubular metal member on the end of a flexible cable;

forming a flattened longitudinal groove on opposite external sides of the metal member by pressing the metal member on both sides;

inserting said compressed metal member into a hole provided in a buckle base and having a projection corresponding to the longitudinal groove such that the flattened portion receives the projection; and



engaging the longitudinal groove of the metal member with the projection of the hole on the buckle base by applying pull to said connector.

4,575,917

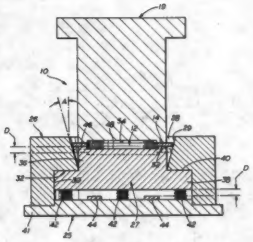
METHOD AND APPARATUS FOR ASSEMBLING SPIRAL WOUND GASKET RINGS INTO GAUGE RINGS

Kenneth W. Kana; Willie H. Kana, and Francis L. Seidel, all of Houston, Tex., assignors to Fluorocarbon/Sepco, Houston, Tex.

Filed Feb. 28, 1985, Ser. No. 706,954

Int. Cl.[4] B21D *39/00*; B23P *11/00*, *3/00*

U.S. Cl. 29—520 **6 Claims**



1. A method of assembling a spiral wound gasket ring of the type embodying a metal strip having a radially projecting outer circumferential bead into a mating annular groove along the inner periphery of an outer gauge ring comprising:

positioning the outer gauge ring and inner spiral wound gasket ring within a tapered opening of a supporting base so that the outer periphery of said gauge ring is in engagement with the adjacent tapered surface defining the tapered opening and the inner periphery thereof is in opposed relation to the bead of said gasket ring while supported on a movable support member extending upwardly within said tapered opening beneath the gauge ring; and

then applying a downward force on said gauge ring to move said gauge ring downwardly along said tapered surface and to move said movable support member downwardly simultaneously whereby the inner periphery of said gauge ring is deformed radially inwardly so that the bead of said spiral wound gasket ring is received within said annular

groove for retaining the gasket ring within the gauge ring in assembled relation.

3. Apparatus for assembling a spiral wound gasket ring having a radially projecting outer circumferential bead thereon into a mating annular groove along the inner periphery of a concentric outer gauge ring comprising:

a support having a frusto-conical opening therein adapted to receive the concentric gasket and gauge rings therein with the frusto-conical surface defining said opening engaging the outer periphery of said gauge ring;

a support member projecting upwardly within said frusto-conical opening adapted to support the gauge ring thereon,

means mounting said support member for vertical movement relative to said support; and

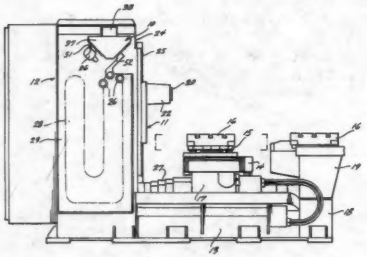
a mandrel mounted for movement downwardly within said frusto-conical opening and adapted to engage said gauge ring and press the gauge ring downwardly along the frusto-conical surface of said opening for deforming said gauge ring radially inwardly thereby to move said groove on said gauge ring radially inwardly to receive the bead on said gasket ring for retaining the gasket ring in assembled concentric relation with said gauge ring.

4,575,918

TOOL CHANGE MECHANISM

Clyde E. Mattson, Waukesha, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jun. 29, 1984, Ser. No. 626,225
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **20 Claims**



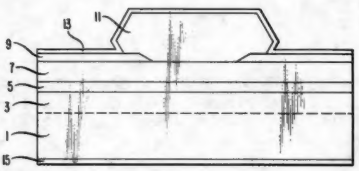
1. In a tool changing mechanism for exchanging the cutting tools in the work station of a machine tool; a frame supporting said work station; a tool ready storage magazine mounted on said frame and carrying a plurality of tools for use in the work station; a tool ready station in said magazine for receiving a selected tool to be transferred to the work station and for receiving the previously used tool transferred from the work station for storage; a tool change mechanism boby; means supporting said body for movement relative to said frame between said tool ready station and said work station; the improvement comprising a pair of tool change arms supported by said body for both pivotal and bodily movement; a grip mounted on each of said arms for securing the tools to be transferred; means disposed in said body for pivoting both of said arms simultaneously about their separate pivot points while at the same time moving the pivot points of both of said arms in a predetermined path of travel for moving one of said grips in a single continuous arcuate path of travel that extracts a previously used tool from the work station and then shifts it away from the work station while at the same time moving the second grip that is carrying a new tool in a second single continuous arcuate path of travel that moves the new tool toward the work station and then loads it into the work station.

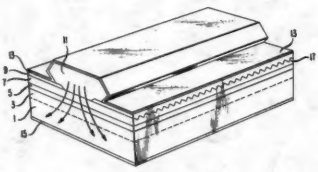
4,575,919

METHOD OF MAKING HETEROEPITAXIAL RIDGE OVERGROWN LASER

Ralph A. Logan, Morristown, and Won-Tien Tsang, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 24, 1984, Ser. No. 613,468
Int. Cl.[4] G02B *6/10*; H01S *3/19*; H01L *29/205*
U.S. Cl. 29—569 L **13 Claims**





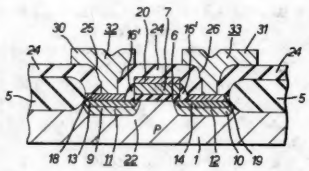
1. A method of making a laser comprising the steps of growing, on a substrate, a first cladding layer having a first conductivity type, an active layer, a second cladding layer having a second conductivity type, forming a dielectric layer with a stripe opening exposing said second cladding layer, growing a ridge in said opening, and metallizing said dielectric layer and ridge and said substrate.

4,575,920

METHOD OF MANUFACTURING AN INSULATED-GATE FIELD-EFFECT TRANSISTOR

Yoshitaka Tsunashima, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed May 2, 1984, Ser. No. 606,403
Claims priority, application Japan, Sep. 28, 1983, 58-179551
Int. Cl.[4] H01L *21/425*
U.S. Cl. 29—571 **14 Claims**



1. A method of manufacturing an insulated-gate field-effect transistor on a silicon substrate of a first conductivity type comprising the steps of:

(a) forming an insulating layer around a predetermined surface portion of said substrate;

(b) forming a gate insulating film and a gate electrode on a portion of said predetermined surface portion, said gate electrode being formed on said gate insulating film;

(c) implanting impurity ions into said predetermined surface

portion between said insulating layer and said gate electrode to form source and drain regions of a second conductivity type having a low impurity concentration, said source and drain regions being spaced apart;

(d) heating said substrate at a first temperature in the range of 900° to 1300° C.;

(e) implanting ions of said second conductivity type into said source and drain regions;

(f) heating said substrate at a second temperature at or below 700° C.; and

(g) forming metal electrodes in ohmic contact with said source and drain regions, respectively.

4,575,921

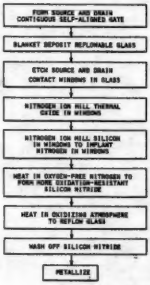
SILICON NITRIDE FORMATION AND USE IN SELF-ALIGNED SEMICONDUCTOR DEVICE MANUFACTURING METHOD

Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 548,712, Nov. 4, 1983, Pat. No. 4,528,211. This application Oct. 1, 1984, Ser. No. 656,182

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 29—571 **4 Claims**


FORM SOURCE AND DRAIN CONTIGUOUS SELF-ALIGNED GATE
BLANKET DEPOSIT REFLOWABLE GLASS
ETCH SOURCE AND DRAIN CONTACT WINDOWS IN GLASS
NITROGEN ION MILL THERMAL OXIDE IN WINDOWS
NITROGEN ION MILL SILICON IN WINDOWS TO IMPLANT NITROGEN IN WINDOWS
HEAT IN OXYGEN-FREE NITROGEN TO FORM MORE OXIDATION-RESISTANT SILICON NITRIDE
HEAT IN OXIDIZING ATMOSPHERE TO REFLOW GLASS
WASH OFF SILICON NITRIDE
METALLIZE

1. A method of making a self-aligned gate and self-aligned contact on an insulated gate field effect transistor in a silicon surface that provides reflow of an overlying glass coating before formation of source and drain regions, the method comprising the steps of successively forming blanket coatings of gate oxide, polycrystalline silicon, and phosphorus doped glass on a silicon surface, masking the glass coating to provide two adjacent window areas on opposite sides of a gate electrode area, where source and drain regions are to be respectively formed, etching the glass and polycrystalline silicon coatings to expose gate oxide within the windows, nitrogen ion milling the gate oxide within each window to expose its underlying silicon surface, continuing to nitrogen ion mill the silicon surface for at least about 30 seconds so as to form a continuous surface region of implanted nitrogen to a depth of about 100–120 angstroms, converting the implanted nitrogen layer into more oxidation-resistant silicon nitride coating by heating the silicon surface in an atmosphere consisting essentially of nitrogen, thereafter heating the silicon surface in wet oxygen for a sufficient duration to reflow the glass layer and oxidize edges of the polycrystalline silicon layer exposed at window edges, implanting an n-type impurity in the silicon surface within the windows beneath the silicon nitride coating, masking and etching the glass layer to form a gate electrode contact window on the polycrystalline silicon coating, preferentially etching the silicon nitride coating within the windows to expose the underlying silicon again, forming a source electrode in contact with the silicon exposed in one window, forming a drain electrode in contact with the silicon exposed within the other window, and forming a gate electrode contacting polycrystalline silicon exposed within the gate electrode contact window.

4,575,922

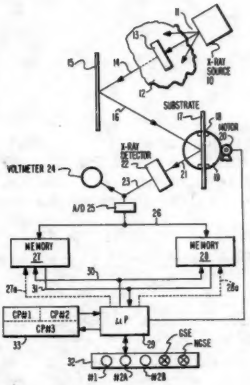
METHOD OF FABRICATING INTEGRATED CIRCUITS INCORPORATING STEPS TO DETECT PRESENCE OF GETTERING SITES

Michael H. Nemiroff, Del Mar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 5, 1984, Ser. No. 668,512

Int. Cl.⁴ H01L *21/265*; B01J *17/00*

U.S. Cl. 29—574 **12 Claims**



1. For use in fabricating integrated circuits on a semiconductor substrate, a method including the steps of:

directing electromagnetic radiation onto said semiconductor substrate at a small angular offset from the substrate's Bragg angle;

measuring the intensity of the radiation that is reflected from said semiconductor substrate at said offset; and

fabricating said circuits on said semiconductor substrate only if the measured intensity is substantially larger than the intensity which would reflect at said angular offset from a defect-free crystal of said semiconductor substrate.

4,575,923

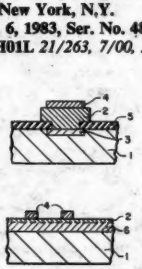
METHOD OF MANUFACTURING A HIGH RESISTANCE LAYER HAVING A LOW TEMPERATURE COEFFICIENT OF RESISTANCE AND SEMICONDUCTOR DEVICE HAVING SUCH HIGH RESISTANCE LAYER

Emil Arnold, Chappaqua, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 6, 1983, Ser. No. 482,671

Int. Cl.⁴ H01L *21/263, 7/00, 21/26*

U.S. Cl. 29—576 B **11 Claims**



1. Method of manufacturing a solid state device having a high resistivity film with a low temperature coefficient of resistance comprising the steps of

forming a thin semi-insulating film, said film consisting of small silicon crystallites embedded in a silicon dioxide matrix,

carrying out ion implantation of said film by one of arsenic or phosphorus ions to produce a resistive layer having a low temperature coefficient of resistance,

forming electrode regions with respect to said film, and annealing said film at approximately 900° C.

4,575,924

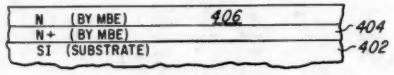
PROCESS FOR FABRICATING QUANTUM-WELL DEVICES UTILIZING ETCH AND REFILL TECHNIQUES

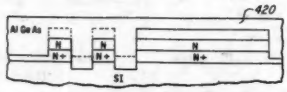
Mark A. Reed, Dallas, and Robert T. Bate, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1984, Ser. No. 626,809

Int. Cl.⁴ H01L *21/203, 21/302, 29/161*

U.S. Cl. 29—576 E **20 Claims**





1. A process for fabricating quantum-well devices, comprising the steps of:

providing a substrate;

providing first and second epitaxial layers of a first semiconductor material on said substrate,

said first layer being doped to a concentration of at least 1E17 per cubic centimeter and being at least 200 nm thick,

and said second layer comprising a dopant concentration no greater than 5E16 per cubic centimeter and a thickness less than 300 Angstroms;

anisotropically etching trenches in a first pattern through said second layer but not entirely through said first layer;

epitaxially growing a second semiconductor material, which has a wider bandgap than said first semiconductor material and is approximately lattice-matched to said first semiconductor material, to substantially fill said trenches;

anisotropically etching trenches in a second pattern through both said first layer and said second layer into said substrate;

epitaxially growing said second semiconductor material, to substantially fill said second trenches; and

forming metallization to configure a desired circuit function;

wherein said first and second patterned trench etches jointly define a plurality of quantum wells within isolated portions of said second layer,

and wherein said second trench etch defines interconnections of said quantum wells within said first layer.

4,575,925

METHOD FOR FABRICATING A SOI TYPE SEMICONDUCTOR DEVICE

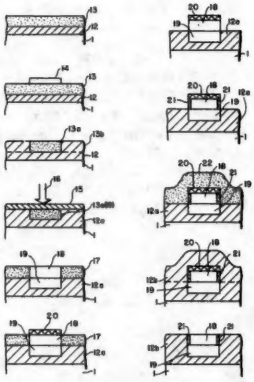
Kazuhiro Kanbara, Kawasaki, and Osamu Hataishi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 28, 1984, Ser. No. 675,613

Claims priority, application Japan, Nov. 30, 1983, 58-225654; Nov. 30, 1983, 58-225657

Int. Cl.⁴ H01L *21/324, 21/36*

U.S. Cl. 29—576 W **28 Claims**



1. A method for fabricating a SOI (Semiconductor on Insulator) type semiconductor device, comprising the steps of:

(a) forming a single crystalline island on an insulating layer formed on a substrate, the single crystalline island having one conductivity type;

(b) forming an epitaxial layer on the single crystalline island;

(c) forming a tentatively-exposed side surface of the epitaxial layer; and

(d) forming a conduction path at the exposed side surface, the conduction path extending from the upper surface of the epitaxial layer to the single crystalline island thereunder.

4,575,926

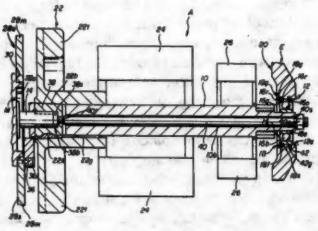
ELECTRIC GENERATOR WITH RAPID REPLACEABLE MOTOR AND METHOD OF MANUFACTURING SAME

Robert R. McMinn, Crosby, Tex., assignor to Harrison Equipment Co., Inc., Houston, Tex.

Division of Ser. No. 471,700, Mar. 3, 1983, Pat. No. 4,501,982. This application Jan. 19, 1984, Ser. No. 571,937

Int. Cl.⁴ H02K *15/02, 15/10*

U.S. Cl. 29—598 **2 Claims**



1. A method for manufacturing an electrical generator with a rapidly replaceable motor of the type which comprises a housing with an end bell portion, a generator shaft rotatable

within the housing, an armature connected to a shaft within the interior of the housing, an opening formed in the end bell of the housing opposite a motor with a rotating motor shaft for rotating the generator shaft, a bearing assembly frictionally mounted within the opening rotatably supporting one end of the generator shaft opposite the motor, the invention comprising the steps of:

said opening forming with an inner, annular surface and forming an annular shoulder in said inner annular surface of said opening, said shoulder comprising a first side parallel to the longitudinal axis of the generator shaft and a second side perpendicular to said first side, said second side extending between said first side and said inner annular surface of said opening;

forming an annular outer groove in said first side of said annular shoulder for mounting a removable outer retaining ring to restrict the bearing assembly against undesired longitudinal movement inward of the housing;

forming an annular inner groove in the outer surface of the bearing assembly adjacent the opening for mounting a removable inner retaining ring to restrict the bearing assembly against undesired longitudinal movement outward of the housing and locking the bearing assembly in the opening;

mounting a removable inner retaining ring onto the bearing assembly;

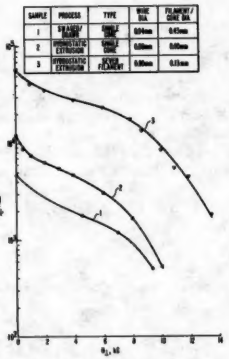
inserting the bearing assembly into the opening to engage said inner retaining ring with said inner annular surface of said opening such that said inner retaining ring engages said second wall of said annular shoulder; and

mounting an outer retainer ring in said first groove in said first side of said annular shoulder whereby said bearing assembly is restricted against movement longitudinal in a direction inwardly or outwardly of said housing.

4,575,927
SUBMICRON-PARTICLE DUCTILE SUPERCONDUCTOR

Aleksander I. Braginski, Pittsburgh, and Alan T. Male, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 293,537, Aug. 17, 1981, Pat. No. 4,411,959.
This application Jul. 29, 1983, Ser. No. 518,597
Int. Cl.⁴ H01L *39/12, 39/24*
U.S. Cl. 29—599 **11 Claims**



1. A method of making a ductile superconducting composite wire from a brittle superconducting compound, said method comprising:

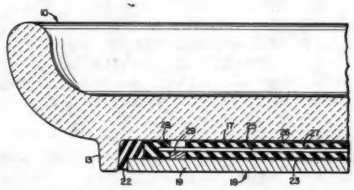
a. encapsulating a submicron-particle superconducting powder is a ductile conducting metal tube; and

b. fabricating a wire from said tube without sintering or reaction annealing said fabricated wire, whereby the superconducting material in the fabricated wire remain as submicron particles.

4,575,928
SERVING DISH WITH HEATING MEANS

Roger A. Starnes, 10230 Belladrum Dr., Alpharetta, Ga. 30201

Division of Ser. No. 512,550, Jul. 11, 1983, Pat. No. 4,493,978.
This application Aug. 29, 1984, Ser. No. 645,228
Int. Cl.⁴ H05B *3/00*
U.S. Cl. 29—611 **6 Claims**

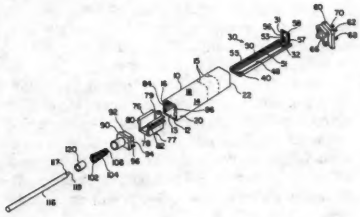


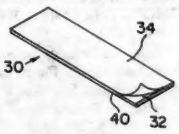
1. A method for constructing a serving dish with heating means, including the steps of providing an electrical heating element comprising a resistance means laminated in heat conductive and electrical insulative means with holes in said heat conductive and electrical insulative means for electrical connection to said resistance means, placing a quantity of solder within said holes, placing said heating element on the bottom surface of said serving dish, placing a bottom plate over said heating element for covering said heating element, and applying heat to said bottom plate for fusing said solder to said bottom plate and resistance means so that said bottom plate is electrically connected to said resistance means.

4,575,929
METHOD FOR MAKING A PRECISION LINEAR POTENTIOMETER SENSOR

William F. Bleeke, North Webster, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 444,181, Nov. 24, 1982, Pat. No. 4,479,107.
This application Jan. 25, 1984, Ser. No. 573,690
Int. Cl.⁴ H01C *17/06*
U.S. Cl. 29—620 **10 Claims**





1. A process for producing a linear potentiometer comprising the steps of (1) forming a uniform coating of resistance material over the surface of a flexible electrically inert sub-

strate, (2) performing in any order the following steps (a) and (b): (a) sculpting the uniform coating to produce electrical elements such as a collector element and a resistor element, each element isolated by the substrate, and (b) disposing conductive paths on said material, (3) inserting the substrate into a housing, (4) mounting for slideable movement within said housing slider means having contactor means in slideable engagement with certain ones of said elements, (5) and providing a means to transduce linear movement of the slider means to a variable voltage output related to the change of position of said slider means relative to the resistor element.

4,575,930

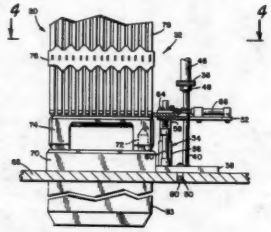
NUCLEAR REACTOR FUEL ASSEMBLY PERIPHERAL ROD LIFTING DEVICE

Jack L. Blickenderfer, Forest Hills Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,054

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—723 **10 Claims**



1. Apparatus for lifting a fuel rod in a fuel assembly, comprising:

means for supporting the fuel assembly in a predetermined position;

a frame adapted for movement relative to said fuel assembly support means;

locating pins secured to said frame for registry with index holes in said fuel assembly support means for effecting adjustable predetermined alignment between said frame and the fuel rods in said fuel assembly;

a plate supported on said frame for generally longitudinal movement relative to said fuel assembly

a yoke supported on said plate for generally lateral movement relative to said fuel assembly, one end of said yoke being adapted to engage a fuel rod;

a first cylinder coupled between said plate and yoke for effecting selective lateral movement thereof between an extended position in engagement with a fuel rod, and a retracted position out of engagement with a fuel rod; and

a second cylinder coupled between said plate and frame for effecting selective longitudinal movement thereof between extended and retracted positions to lift a fuel rod as desired.

4,575,931

DEVICE FOR AUTOMATICALLY CONNECTING ELECTRIC CONDUCTORS ON A REGROUPING MEMBER

Henri V. J. Jonca, Toulouse, France, assignor to Societe Nationale Industrielle Aerospatialle, Paris, France

Filed Mar. 15, 1984, Ser. No. 589,736

Claims priority, application France, Mar. 16, 1983, 83 04323

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—747 **8 Claims**

1. A device for automatically inserting electric conductors into a regrouping member having a plurality of connection sites disposed in a prearranged pattern, said device comprising:

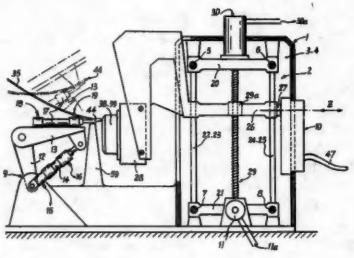
a frame;

a tool fixed to said frame for connecting an end of one of said conductors to a preselected connection site on a regrouping member;

a carriage mounted in said frame for reciprocating movement and movement perpendicular to said reciprocating movement;

an addressing pattern fixed to said frame comprising a plurality of individually controllable activation members each of which corresponds to a single one of said connection sites, said activation members being arranged in a pattern identical to that of said connection sites;

a sensor sensitive to said activation members, said sensor being mounted in said carriage in proximity to said addressing pattern;



mounting means carried by said carriage and movable therewith for holding a regrouping member in proximity to said tool for connection of a conductor to a selected connection site;

said mounting means and said sensor being so positioned on said carriage that when said sensor is in position to be activated by one of said activation members, said regrouping member is positioned adjacent said tool for insertion of a conductor into the connection site corresponding to said one of said activation members;

displacement means for moving said carriage and said sensor such that said sensor successively scans all of the activation members of the addressing pattern; and

means controlled by said sensor for actuating said tool.

4,575,932

HAND TOOL FOR TERMINATING WIRES IN A CONNECTOR

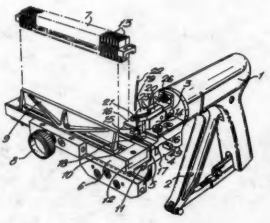
Manfred Joos, Mannheim-Wallstadt, and Werner Maack, Seeheim, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1983, Ser. No. 555,092

Claims priority, application United Kingdom, Nov. 27, 1982, 8233876

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—751 **6 Claims**



1. A hand tool for terminating wires (22) successively in

respective electrical contacts arranged at intervals (13) in a row in an electrical connector (7), the tool comprising a wire inserting ram (3) movable along a ram path, a frame (4) having a guideway (5) therein for a connector support (6), the guideway extending transversely of the ram path wherein said ram is reciprocable relative to said frame, and connector support indexing means (10, 33, 38) mounted on the frame (4) and operably connected to the ram (3) to index the connector support (7) along the guideway (5) by movement of the ram (3), characterized in that the indexing means comprises: a toothed indexing wheel (33) rotatably mounted in the frame (4) and about an axis extending transversely of the ram path and transversely of the guideway (5), the wheel (33) being engageable with a complementary rack (10), the rack being carried by and extending longitudinally of the connector support (6) so that rotation of the wheel (33) effects movement of the connector support (6); a forked driving member (43) provided for the wheel (33), the driving member (43) being slidably mounted in the frame (4) and having a rear stem portion (46) pivotally coupled to the ram (3) by a lost motion coupling (47, 48), the driving member (43) having two arms (44, 45) extending forwardly from the stem portion (46), one arm being located on each side of the wheel (33) and spaced apart by a distance greater than the wheel (33) diameter, each arm (44, 45) having at its forward end an inwardly directed tooth (54, 55) adapted drivingly to engage the wheel (33) on rearward movement of the driving member (43); a slide member (49) mounted in the frame (4) for sliding movement transversely of the ram path and effective selectively to pivot the driving member (43) about the coupling (47, 48) on sliding movement in opposite directions, in order to engage either arm (44, 45) of the driving member (43) with the wheel (33), and wherein the teeth (54, 55) of the arms (44, 45) are shaped at their forward sides to engage the wheel teeth with a camming action to cam the arms (44, 45) out of engagement with the wheel (33) on forward movement of the driving member.

4,575,933

APPARATUS FOR PLACING OR MOUNTING RING TRAVELERS ON SPINNING OR TWISTING RINGS

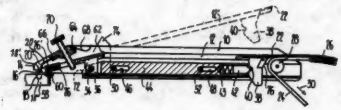
Andreas Neff, Pfäffikon, Switzerland, assignor to Bräcker AG, Pfäffikon, Switzerland

Filed Oct. 1, 1984, Ser. No. 656,674

Claims priority, application Switzerland, Oct. 5, 1983, 5421/83

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—765 **13 Claims**



1. An apparatus for mounting ring travelers on a spinning or twisting ring, comprising:

a housing structured as a handle and defining at least one open end face;

a magazine bar arranged in said housing and serving to receive a supply of the ring travelers;

said magazine bar defining an end adjacent said at said at least one open end face of said housing;

said end of said magazine bar being tapered and being bent-off in the manner of a hook;

a stop connected to said magazine bar and outwardly displaceable out of a traveling path of said ring travelers;

a separator element comprising a separating edge and serving for forwardly displacing a foremost ring traveler of said supply of ring travelers while overcoming said stop connected to said magazine bar;

said magazine bar and said separator element being displaceable relative to each other at least in lengthwise direction between an inoperative position and an operative position;

said end of said magazine bar, which is bent-off in the manner of a hook, defining a longitudinal side; and

said separator element comprising a clamping jaw which coacts with said longitudinal side of said end of said magazine bar in order to temporarily and fixedly clamp said foremost ring traveler, which is forwardly displaced from said supply of ring travelers, at one curved portion thereof.

4,575,934

METHOD AND SYSTEM FOR AUTOMATICALLY ATTACHING SUB-ASSEMBLY TO MAIN ASSEMBLY USING INDUSTRIAL ROBOTS

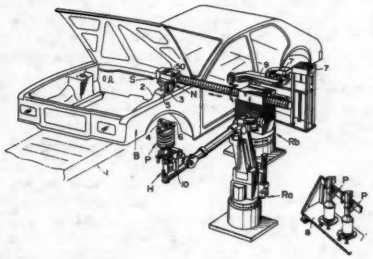
Kengo Kitamura, Koshigaya, and Hitoshi Murata, Zama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 21, 1983, Ser. No. 534,241

Claims priority, application Japan, Sep. 22, 1982, 57-163960; Sep. 22, 1982, 57-163961; Sep. 22, 1982, 57-163962; Dec. 29, 1982, 57-230298

Int. Cl.⁴ B23P *21/00*

U.S. Cl. 29—787 **19 Claims**



1. A system for automatically attaching a workpiece to a main workpiece, the main workpiece being transported on a transporting means, comprising:

(a) first means for automatically carrying the workpiece toward a predetermined position of the main workpiece at which the workpiece is to be attached to the main workpiece, the main workpiece being stopped on the transporting means;

(b) second means for automatically carrying an automatic fastening tool holding fastening means toward the predetermined position of the main workpiece so that the main workpiece is sandwiched between said fastening tool and workpiece;

(c) third means for engaging said second means with said first means so as to position the workpiece with respect to the fastening tool;

(d) fourth means for slidably engaging said second means positioned with respect to the workpiece with the main workpiece so as to position the workpiece and fastening tool with respect to the main workpiece; and

(e) fifth means for actuating said fastening tool positioned with respect to the main workpiece to fasten the workpiece to the predetermined position of the main workpiece with said fastening means.

4,575,935

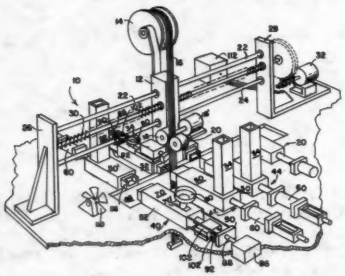
METHOD AND APPARATUS FOR APPLYING A CONNECTOR HAVING AN INJECTION MOLDED COVER TO MULTICONDUCTOR CABLE

Charles E. Shields, 655 Woodland St., Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 351,595, Feb. 23, 1982. This application Jun. 20, 1983, Ser. No. 505,915

Int. Cl.[4] H01R *43/00*; B23P *19/00*

U.S. Cl. 29—858 **71 Claims**



1. A method of attaching at least one connector to a flat multiconductor cable, said method comprising:

staking a first connector half to a portion of a flat multiconductor cable which includes a plurality of spaced conductors covered with insulation such that contact pins of the first connector half contact corresponding conductors of the cable; and

molding an insulating second connector half to the staked first connector half, whereby a complete connector staked to a portion of a flat multiconductor cable is provided.

35. An apparatus for attaching connectors to a flat multiconductor cable, the apparatus comprising:

an attaching means for selectively attaching a first connector portion to a flat multiconductor disposed thereadjacent;

a molding means operatively connected with the attaching means for selectively molding a second connector portion attached to the first connector portion and a portion of the flat multiconductor cable disposed thereadjacent; and,

a positioning means operatively connected with attaching means and the molding means for selectively positioning the flat multiconductor cable adjacent the attaching means and the molding means in an operative relationship therewith, whereby a first connector portion is attached to the flat multiconductor cable and a second connector portion is molded to the first connector portion and a cable portion thereadjacent.

4,575,936

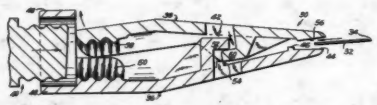
BLADE RETAINING TOOL HEAD

Donald Gringer, One Bishop Rd., Bedford, N.Y. 10506

Filed Feb. 6, 1985, Ser. No. 698,780

Int. Cl.[4] B26B *5/00*

U.S. Cl. 30—169 **20 Claims**



1. A tool head for releasably retaining a blade, comprising:

a body having a first blade receiving lip and first thread means remote from said lip;

a clamping member having a second blade receiving lip and second thread means remote from said second lip;

cooperatively interengaging hinge means on said body and clamping member for enabling connected relative pivotal movement therebetween to carry said first and second lips into and out of relative blade retaining proximity, said hinge means on each of said body and clamping member being disposed intermediate said respective lip and thread means;

a threaded operating member rotatably engageable with said first and second thread means; and

camming means on at least one of said clamping member and operating member and engageable with the other of said clamping member and operating member as the operating member is rotated to a locking position to cause said relative pivotal movement of the clamping member and body about said hinge means thereby carrying said lips into blade retaining proximity for securely clamping a blade between said lips.

4,575,937

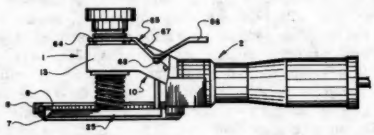
DEPTH CONTROL GAUGE FOR MEAT TRIMMING KNIFE

Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089

Filed Oct. 22, 1984, Ser. No. 663,499

Int. Cl.[4] B26B *25/00*

U.S. Cl. 30—276 **20 Claims**



1. An improved depth control gauge for use with a meat trimming knife of the type having a ring-shaped blade holder mounted on the front end of a handpiece with a ring-shaped cutting blade having a central opening being rotatably mounted on the blade holder; said depth control gauge including:

(a) depth control plate means adapted to be disposed within the central opening of the cutting blade for controlling the thickness of a section of meat severed from a larger body of meat passing between the plate means and cutting blade;

(b) mounting means adapted to be attached to the handpiece for movably mounting the plate means on the handpiece for axial movement with respect to the ring-shaped blade opening; and

(c) lever means adapted to be pivotally mounted on the handpiece and operatively engageable with the plate means for manually moving the plate means on the mounting means between a lowered depth control position and a raised non-control position.

4,575,938

MEAT TRIMMING KNIFE

Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089

Filed Jul. 12, 1984, Ser. No. 630,005

Int. Cl.[4] A22C *17/04*; B26B *15/00*

U.S. Cl. 30—276 **22 Claims**

1. An improved meat trimming knife including:

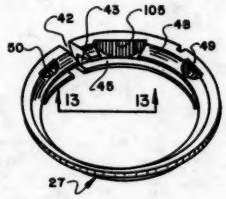
(a) a handle;

(b) a frame secured to the front end of the handle having a central portion and a pair of outwardly extending arms providing a concave front end to the frame, with one of said arms being removably mounted with respect to the other of said arms and central portion of the frame for

movement between a blade securing position and a blade removal position;

(c) a ring-like blade holder mounted on the frame, said holder being split at one location on its circumference located at the concave front end of the frame adjacent the mounting location of the removable arm on the central portion;

(d) a pair of attachment means, each being associated with a respective one of the arms, for attaching the blade holder to a respective one of said arms on opposite sides of the split;



(e) a ring blade rotatably mounted on the blade holder having gear teeth formed circumferentially about one edge,

(f) a power driven gear rotatably mounted within the central portion of the frame for meshing driving engagement with the gear teeth of the ring blade for rotating said ring blade on the blade holder;

(g) said split location being circumferentially spaced from said power driven gear; and

(h) clamping means engageable with the frame and removably mounted arm for securing said removably mounted arm the blade securing position on the frame.

4,575,939

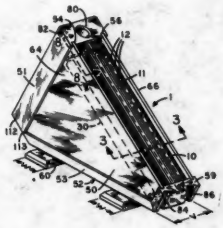
CUTLERY STORAGE APPARATUS

Michael E. Buchtel, 2467 Norse Ave., Costa Mesa, Calif. 92627

Filed Jul. 6, 1984, Ser. No. 628,620

Int. Cl.⁴ A47F *5/16*

U.S. Cl. 30—296 A **9 Claims**



1. An apparatus for holding thin objects comprising:

a filler including a plurality of thin flexible sheets placed in side by side relation;

pressure means applying a force to the outer sheets of said filler, said pressure means producing a compression force between the individual sheets of said filler for gripping thin objects;

a means for causing the sheets of said filler proximate one edge of said filler to flare outward;

a housing shaped to receive said filler, said pressure means applying the compression force independent of said housing; and

a pair of movable rectangular bases on the housing capable of an inward and an outward position, said bases being wider than the thickness of the housing when in an outward position, said bases being thinner than the thickness of said housing when in an inward position.

4,575,940

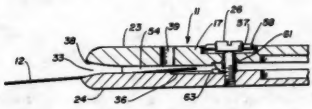
REPLACEABLE BLADE KNIFE

Michael D. Wenzel, 2251 Clinton Ave., Apt. #E, Alameda, Calif. 94501

Continuation of Ser. No. 172,200, Jul. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 175, Jan. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 931,556, Aug. 7, 1978, abandoned. This application Mar. 13, 1985, Ser. No. 711,589

Int. Cl.⁴ B26B *1/00*

U.S. Cl. 30—335 **9 Claims**



1. A knife blade holder for a thin elongated blade having two sharpened longitudinally extending edges on opposed sides of said blade and an elongated open center portion having its longitudinal axis parallel to said edge, said holder comprising:

a first and a second body section, each having a handle portion and a blade-holding portion with each blade holding portion having a flange;

connecting means for connecting said sections together, said connecting means being located adjacent said blade-holding portions and having a tightened position for clamping said blade between said blade-holding portions and a first loosened position permitting separation while still connected together of said blade holding portions to define a passageway therebetween said passageway having one open end for slidable insertion and withdrawal of said blade into and out of said passageway and with said flanges forming walls which at least partly enclose said passaeway;

said first blade-holding portion having a first ramped end at the opening of said passageway, a lip extending beyond said second blade holding portion and an internal elongated shoulder extending longitudinally in said passageway, said shoulder being ramped to blend smoothly with said first ramped end and dimensioned to engage said blade open center portion and positioned to hold the edges of said blade out of dulling contact with the walls of said passageway during insertion and withdrawal of said blade, said shoulder also formed to hold the edges of said blade out of dulling contact with the walls of said passageway when force is applied to said blade while work is performed with said blade; and

said second blade-holding portion having a second ramped end at the opening of said passageway, a channel for receiving said shoulder when said connecting means is in tightened position and a flat face for frictionally engaging said blade when said connecting means is in said tightened positioned.

4,575,941

DRY SHAVERS

Charles C. Packham, Wokingham, United Kingdom, assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 443,974, Nov. 23, 1982, abandoned. This application Jan. 14, 1985, Ser. No. 691,365

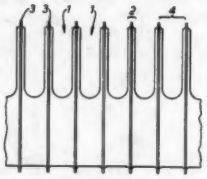
Claims priority, application United Kingdom, Nov. 23, 1981, 8135234; Nov. 23, 1981, 8225907

Int. Cl.⁴ B26B *19/04*

U.S. Cl. 30—346.51 **6 Claims**

1. An inner cutter for a dry shaver, comprising an annular metallic hollow tube having a 360° right-circular cross-section,

a plurality of slots formed transversely at intervals along the length of said tube to provide fluid communication between the exterior of said tube and the hollow interior of said tube to define a series of arcuate bridge members, a plurality of arcuate teeth of lesser axial extent than said bridge members formed on said bridge members by shallow annular grooves formed at finite depth in the external circumference of said tube, said grooves reducing the thickness of said bridge members, each of



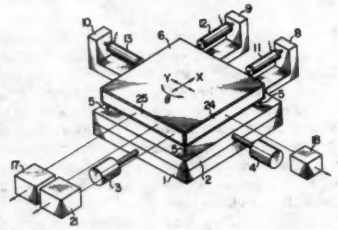
said bridge members having a single tooth formed thereon, the thickness of said bridge members to either side of said tooth being reduced by the depth of said grooves, wherein each of said grooves span a respective slot and an axial margin of the adjacent said bridge member on each side of the said slot, so that each of said arcuate teeth form part of an annular band extending commpletely around said tube between adjacent said grooves.

4,575,942

ULTRA-PRECISION TWO-DIMENSIONAL MOVING APPARATUS

Shigeo Moriyama, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,991
Claims priority, application Japan, Oct. 18, 1982, 57-181338
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—1 M **15 Claims**



1. An ultra-precision two-dimensional moving apparatus comprising:

a coarse-moving carriage movable two-dimensionally;

a coarse drive mechanism for moving said coarse-moving carriage two-dimensionally;

a fine-moving table adapted to finely move two-dimensionally on said coarse-moving carriage;

a mechanism for finely-movably holding said fine-moving table on said coarse-moving carriage with a gap therebetween, the gap being filled with a viscous fluid; and

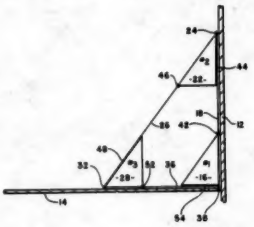
at least three linear-actuating means interposed between said coarse-moving carriage and said fine-moving table for finely driving said fine-moving table, each of said linear-actuating means being provided with at least one member which is rigid in the direction of the central axis thereof and flexible in a direction tilted with respect to the central axis thereof.

4,575,943

RIGHT ANGLE MEASURING APPARATUS

Fredrick W. Baum, Jr., 1541 Ocean Ave. #308, Santa Monica, Calif. 90401

Filed Mar. 29, 1985, Ser. No. 717,910
Int. Cl.[4] G01B *3/10*
U.S. Cl. 33—138 **3 Claims**



1. An angle measuring apparatus comprising:

three tape measures each having a housing and a tape extending therefrom;

the tape of the first of said tape measures being connected to the housing of said second tape measure;

the tape of said second tape measure being connected to the housing of said third tape measure; and

the tape of said third tape measure being connected to the housing of said first tape measure;

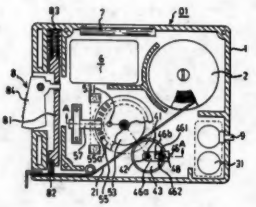
said tape measures being adjustable such that the indicia output on each are identical when said apparatus indicates a right triangle.

4,575,944

ELECTRONIC DIGITAL TAPE-RULE

Patrick Lin, 12th Fl., No. 1034, Min Sheng East Rd., Taipei, Taiwan

Filed Jun. 19, 1985, Ser. No. 746,410
Int. Cl.[4] G01B *3/10*
U.S. Cl. 33—138 **3 Claims**



1. An electronic digital tape. rule consisting of a housing, a rotatable tape reel encased within said housing and having a flexible and extensible measuring tape, a power source for supplying electric power to the electronic circuit, an actuator acting as a switch means for selecting a forwarding or backwarding count of a counter, a detector for sensing the number of revolutions of a disc as the tape is extended and for generating a signal in response thereto, a counter responsive to the signal generated by said detector for accumulating a count representative of the length of said tape, a display for displaying the count accumulated by said counter, a brake for stopping and releasing said tape and a power switch; characterized by that said actuator comprising:

a friction roll rotatably mounted on a shaft fixed at an inner wall of said housing;

a disc disposed on the upper end of said roll and rotatable by the friction of the roll;

a plate fixed on the upper end of said roll and having a hole with a pair of contact plates attached on the two side walls thereof;

a spring mounted between said disc and said plate for constantly pressing the disc against said roll; and

an actuating rod disposed upright on the upper side of said disc and being arranged in such a manner that its upper end passes through the hole of said plate and is able to contact one of said two contact plates depending on the rotating direction of said disc.

4,575,945

MEASURING ARRANGEMENT, AND A METHOD, FOR MEASURING THE GAP FORMED BETWEEN A FIRST AND A SECOND ROLL OR ROLLER

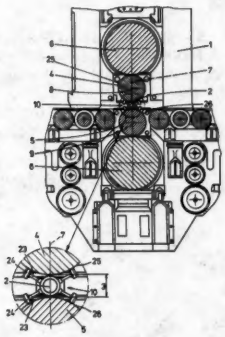
Günter Rigler, Linz, Austria, and Friedrich Vollmer, Hagen, Fed. Rep. of Germany, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria and Friedrich Vollmer Fienmessgeratebau GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,717

Claims priority, application Austria, Apr. 6, 1984, 1183/84

Int. Cl.⁴ G01B *7/14*

U.S. Cl. 33—182 **9 Claims**



1. In a measuring arrangement for measuring the gap formed between a first and a second roll or roller and of the type including a measuring body, at least three support rollers provided on said measuring body on one side thereof for adjusting said measuring body between said first and second rolls or rollers and getting into contact with a surface of one of said first and second rolls or rollers, two of said support rollers being arranged on either side of said gap to be measured, symmetrical with respect to the gap plane, at least two support rollers being provided on the opposite side of said measuring body to get into contact with the surface of the second roll or roller, contacting the surface of said second roll or roller in contact points located symmetrical to the gap plane, wherein at least two support rollers arranged symmetrical to the gap plane and provided for one of said first and second rolls or rollers are synchronously movable towards the surface of said one of said first and second rolls or rollers and are pressable thereat, two diametrically oppositely arranged measuring tracers being provided on said measuring body and including measuring heads movable towards the surfaces of said rolls or rollers in a symmetrical plane between said support rollers getting into contact with the surfaces of said rolls or rollers on either side of said gap plane, i.e., in the gap plane, the improvement wherein said support rollers have support roller axles that are directed perpendicular to the axes of said rolls or rollers and are pivotably mounted on said measuring body.

4,575,946

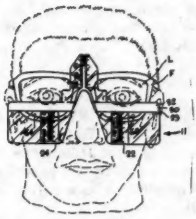
OPHTHALMIC GUIDE FOR MULTI-FOCAL SPECTACLES

Paul F. Bommarito, 10684 Martinwood Way, Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 534,491, Sep. 3, 1983, abandoned. This application Aug. 17, 1984, Ser. No. 642,052

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 33—200 **12 Claims**



1. A guide for prescribing multifocal spectacles comprising,

a transparent fixture to be placed over spectacles having a pair of zero power, planar, transparent members disposed in spectacle relationship, the fixture having a lengthwise axis spanning spectacle frames at least from hinge-to-hinge,

a first stripe with defined edges disposed across portions of the fixture parallel to the lengthwise axis, the stipe having a vertical width corresponding to an apparent dimension of a video display terminal seen at a terminal viewing distance, and

a second stripe with defined edges disposed parallel and adjacent to said first stripe, said second stripe having a width, when added to the vertical width of the first stripe, corresponding to an apparent dimension of a video display terminal seen at a distance.

4,575,947

MEASURING ARM FOR A MULTIPLE COORDINATE MEASURING MACHINE

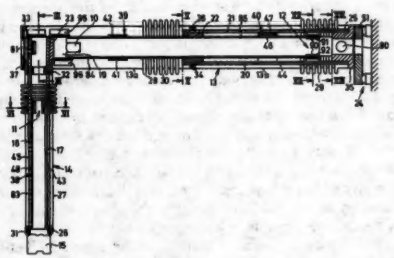
Siegfried T. Stauber, Zurich, Switzerland, assignor to Wyler AG, Switzerland

Filed Mar. 9, 1984, Ser. No. 587,971

Claims priority, application Switzerland, Mar. 30, 1983, 1775/83

Int. Cl.⁴ G01B *5/00*

U.S. Cl. 33—561 **16 Claims**



1. A measuring arm for a multiple coordinate measuring machine, comprising:

a vertical arm part;

a horizontal arm part fixedly connected to said vertical arm part, said horizontal arm part including first and second horizontal arm portions arranged end to end and being

bendable in only first and second planes, respectively, said first and second planes being perpendicular;

chuck means for rigidly coupling a mechanically acting probe member to a free end of one of said arm parts; and

first and second primary elements, with sensor means for producing signals, mounted in said vertical and horizontal arm parts, respectively, and spaced from said chuck means such that said primary elements react to bending movements of said arm parts along different measuring coordinates and said sensor means produce signals in response to said bending movements;

whereby bending of said horizontal arm portions causes said primary elements and sensor means to produce signals corresponding to X and Z axes, respectively.

4,575,948

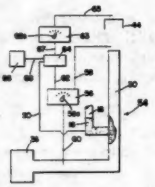
PNEUMATIC TRANSPORT AND HEAT EXCHANGE SYSTEMS

Lester G. Massey, Moreland Hills, Ohio; Lawrence G. Clawson, Dover, and Andrew J. Syska, Marblehead, both of Mass., assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio

Division of Ser. No. 76,289, Sep. 7, 1979, Pat. No. 4,374,540, which is a continuation-in-part of Ser. No. 942,677, Sep. 15, 1978, abandoned. This application Feb. 17, 1983, Ser. No. 467,392

Int. Cl.[4] F26B *3/10*; F28D *19/02*

U.S. Cl. 34—10 **12 Claims**



1. A method of cocurrent heat exchange between a gaseous medium and a particulate material which provides a heat exchange surface for direct heat transfer with said gaseous medium comprising providing a stream of said gaseous medium, withdrawing particulate material from a supply thereof through flow restricting means including adjustment means to form an accumulation of particulate material sloping in its natural angle of repose a predetermined distance toward said stream, introducing said particulate material into said stream at a controlled flow rate by biasing said particulate material from said accumulation thereof into said stream, pneumatically conveying said particulate material with said stream, said stream undergoing a pressure drop during the pneumatic conveyance of said particulate material proportional to the weight flow rate of said particulate material, the step of introducing said particulate material into said stream including sensing said pressure drop and varying the biasing of particulate material into said stream as a direct function of the sensed pressure drop to control the flow rate of said particulate material, transferring heat between said stream and particulate material as a direct function of the weight flow rate of said particulate material during pneumatic conveyance, and maximizing the quantity of heat transferred for a preselected pressure drop by violently mixing said stream and particulate material in at least one localized zone during pneumatic conveyance.

9. A heat exchanger apparatus for heat transfer between a gaseous medium and a particulate material comprising a lift line for confining a stream of said gaseous medium as it pneumatically conveys said particulate material to a separation chamber while undergoing cocurrent heat transfer therewith, a downcomer defining a substantially unobstructed passageway for the flow of particulate material from an inventory of particulate material to said lift line, said downcomer including an upper inlet for receiving particulate material from said inventory thereof under the influence of gravity and a lower outlet for transferring particulate material to said lift line, said downcomer having a substantially vertical portion intermediate said upper inlet and lower outlet for confining said particulate material in a loose packed bed column and a laterally extending portion adjacent said lower outlet for restricting the flow of particulate material through said downcomer and forming an accumulation of particulate material sloping in its natural angle of repose toward said lower outlet, said laterally extending portion including adjustment means for varying the cross-sectional area of said laterally extending portion and causing said accumulation of particulate material sloping in its natural angle of repose to extend along said laterally extending portion a predetermined distance, and biasing means for disturbing said accumulation of particulate material from its natural angle of repose and causing said particulate material to directly flow through said lower outlet and into said lift line and stream of gaseous medium, said lift line having a substantially vertical orientation whereby the relative velocity difference between said particulate material and stream is maximized with violent mixing of said particulate material and stream in at least one localized zone during pneumatic conveyance to provide corresponding maximization of heat transfer.

4,575,949

PRESS FOR PRESSING BATCHES OF ARTICLES DRY

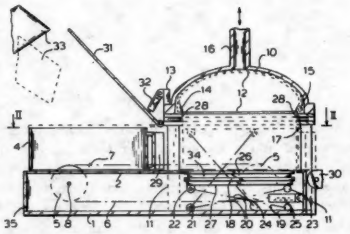
Gerhard Bernecker, Heilbronn, Fed. Rep. of Germany, assignor to Passat Maschinenbau GmbH, Heilbronn/Frankenbach, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,225

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341683

Int. Cl.[4] D06F *47/06*

U.S. Cl. 34—14 **7 Claims**



1. A continuous method for pressing batches of articles dry, particularly batches of laundry, in a press, comprising the steps of:

(a) filling a receiving vessel having an open top and bottom with the batch of articles at a filling station with a plate disposed below the vessel;

(b) moving the receiving vessel along the plate to a pressing station where the plate is provided with an orifice in which is disposed a counterplate;

(c) raising the counterplate with a lifting device through the open bottom and top of the receiving vessel into a pressure vessel disposed thereabove;

(d) locking the counterplate into a pressing position, closing the pressure vessel;

(e) lowering the lifting device;

(f) withdrawing the receiving vessel from the pressing station to the filling station to receive the next batch of articles; and

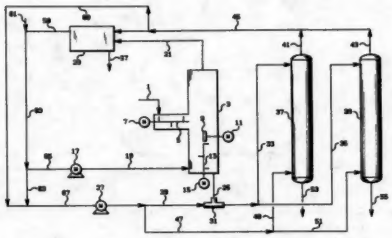
(g) pressing the articles on the counterplate.

4,575,950

METHOD FOR REMOVAL OF RESIDUAL SOLVENT FROM PARTICULATE CRUMB MADE BY SOLUTION POLYMERIZATION

John M. Miles, Overijse, Belgium, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1983, Ser. No. 549,719
Int. Cl.[4] F26B 3/06
U.S. Cl. 34—27 6 Claims



1. A method for removing residual solvent dissolved in non-sticky crumb particles of polymer produced by solution polymerization said particles having been treated substantially to remove solvent from the surface of the polymer crumb particles, said method comprising:

(1) transferring said particles containing residual dissolved solvent into a closed storage zone in an inert atmosphere,

(2) maintaining said particles containing residual solvent in said zone in a quiescent state at a temperature below the softening point of the polymer for a period of time sufficient for accumulation of solvent diffused from said particles as free solvent,

(3) passing inert gas through said polymer particles in said storage zone at a temperature below the softening point of the polymer in an amount sufficient substantially to remove the accumulation thereof free solvent from said storage zone, and

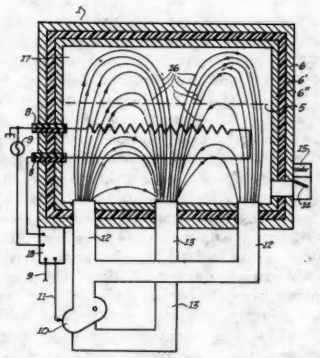
(4) repeating steps (2) and (3) alternately until solvent content in the polymer particles in the storage zone is reduced to the desired level.

4,575,951

CLOSED CHAMBER DRYER

Ramon C. Eyzaguirre, 5217 Harrison St., Hollywood, Fla. 33021

Filed Apr. 4, 1984, Ser. No. 596,727
Int. Cl.[4] F26B 3/04
U.S. Cl. 34—30 13 Claims



1. A method for drying articles comprising the steps of:

providing an air-containing environment closed to the ambient;

including articles in said air-containing closed environment;

directly heating the air in said environment;

thereafter circulating said heated air in said environment in a circulation circuit closed to the ambient for drying said articles whereby effecting more efficieint drying of said articles;

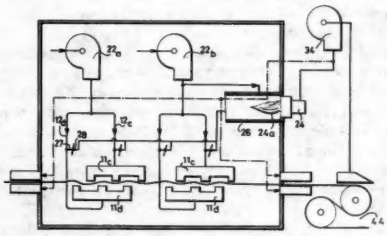
said step for heating includes the step for directly preheating said air in said environment to a preselected preheat temperature prior to said step for circulating; and cooling said environment after said step for circulating by introducing cool air from the ambient.

4,575,952

HOT AIR DRYER STRUCTURE

Rene Bodenan, Ballancourt/Essonne, and Nicholas Teculescu, Meudon, both of France, assignors to M.E.G., S.A., Morangis, France

Continuation-in-part of Ser. No. 303,488, Sep. 18, 1981, abandoned. This application Sep. 12, 1984, Ser. No. 649,601
Int. Cl.[4] F26B 13/20
U.S. Cl. 34—54 41 Claims



1. Apparatus for simultaneously drying in hot air a continuous web of flexible material carrying a solvent to be evaporated and supporting said continuous web of flexible material; said apparatus comprising:

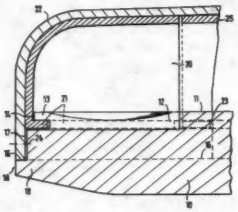
a casing having a web inlet opening and a web outlet opening for said web, said web traveling between said inlet opening and said outlet opening in a general path (D) which extends longitudinally through the interior of said casing; said casing comprising at least two modular sections which contain respective chambers in adjacent relation longitudinally of said casing; each of said two sections having an upper set of nozzles and a lower set of nozzles disposed respectively above and below said general path; each of said two sections including air recycling means having input means communicating with said interior of said casing and output means; heater means; air exhaust means for extracting air from the interior of said casing; duct means coupled between said output means and said upper set of nozzles and said lower set of nozzles of the respective said section; conduit means for placing said heater means in communication with said duct means for preheating the air recycled to said sets of nozzles by said output means of said recycling means; and solvent concentration sensing means for sensing the concentration of said solvent in the atmosphere within said casing; said solvent concentration sensing means being connected to said air exhaust means for controlling said air exhaust means, and second pressure sensing means sensitive to the pressure difference between the inside and the outside of said casing; said second pressure sensing means connected to said air exhaust means for further controlling the flow through said exhaust means.

4,575,953

SAFETY SHOE WITH TOE PROTECTING CAP

Gerhard Hetzel, Zeilhofweg 50, 7104 Obersulm 2, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,714
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308511
Int. Cl.[4] A43C *13/14*
U.S. Cl. 36—77 R 15 Claims



1. Safety shoe comprising a toe protecting cap (20) shaped to conform substantially to the tip of said shoe and provided at its portion facing the sole of said shoe with an inwardly directed flanged rim (21) which is inserted into a groove (12) provided in the vertical end face of a one piece sole (10) and is retained therein by the upper (22) of said shoe, an upper groove wall (13) being set back with respect to a lower groove wall (19) by at least the thickness of said toe protecting cap (20), said lower grove wall (19) provided with an offset portion (16) at the end facing said toe protecting cap (20) extending parallel to and offset a distance from said groove (12) and said shoe upper (22) being attached to a vertically extending section (17) of said lower groove wall (19) which is flush with the outer surface of said toe protecting cap (20), a front face (18) of said lower groove wall (19) being flush with the outer surface of said shoe upper (22) attached to said vertically extending section (17), said one piece sole (10) is provided with said groove (12) therein and that at least one of the height and depth of said groove (12) is slightly less than the corresponding thickness and length of said flanged rim (21) of said toe protecting cap (20) and said flanged rim (21) of said toe protecting cap (20) is tightly inserted into said groove (12) provided in said one piece sole (10) until said toe protecting cap (20) bears against a front face (14) of said upper groove wall (13) so that said toe protecting cap is retained immovably in said groove (12).

4,575,954

SHOE CONSTRUCTION WITH FOOT AND ANKLE RESTRAINING MEANS

Michael E. Bye, 13910 SE. Aldridge Rd., Portland, Oreg. 97236

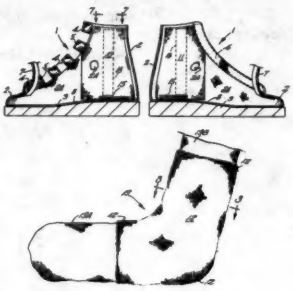
Filed Feb. 16, 1984, Ser. No. 580,937
Int. Cl.[4] A43B *7/20*
U.S. Cl. 36—89 4 Claims

1. In combination,

high-top athletic footwear having an upper and an insole,

a foot covering of fabric construction including interior adhesive means for adhering contact with the epidermis of the wearer's foot, and

an expanse of closure material carried interiorly by the footwear upper and extending substantially between the shoe insole and the top edge of the upper, additional closure material carried by the exterior of the foot covering and engageable with said expanse of closure material to prevent slippage between the upper and the foot covering whereby extreme lateral rolling movement of the foot



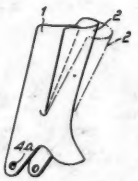
is inhibited by the footwear by reason of the upper thereof being put into tension.

4,575,955

SHOE, IN PARTICULAR A SKI SHOE, INCORPORATING A FLEX AND SIDE AND FORWARD LEAN ADJUSTMENT DEVICE

Bruno Borsoi, Conegliano Veneto, Italy, assignor to NORDICA S.p.A., Montebelluna, Italy

Filed Jul. 9, 1982, Ser. No. 396,548
Claims priority, application Italy, Jul. 23, 1981, 23099 A/73
Int. Cl.[4] A43B *5/04, 11/00*
U.S. Cl. 36—117 2 Claims

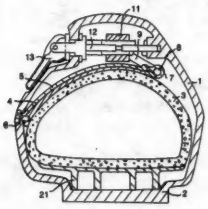


1. A composite front gaiter for a shoe, in particular a ski shoe with a flex and side and forward lean adjustment device, said front gaiter having a longitudinal extension, a widthwise extension and an upwards extension and being adapted to be mounted on a shell portion of the ski shoe, said front gaiter including a first gaiter portion having a front side and an open rear side and a second gaiter portion, said first gaiter portion having an overall upwards extension offset to the overall upwards extension of said second gaiter portion, said second gaiter portion overlapping the front side of said first gaiter portion, said first gaiter portion having first hinge means on a lower end thereof with a first hinge axis extending in said widthwise direction, said second gaiter portion having second hinge means on a lower extremity thereof with a second hinge axis extending in said widthwise direction, said second hinge axis being upwardly offset with respect to said first hinge axis thereby to allow independent swinging of said second gaiter portion relative to said first gaiter portion and means for positioning and mutually securing said first and second gaiter portions together.

4,575,956
FOOT RETENTION DEVICE FOR SKI BOOT

Jean Paris, Chemin de la Côte, Sevrier, F - 74410 Saint-Jorioz, France

Filed Aug. 29, 1984, Ser. No. 645,183
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—119 **5 Claims**

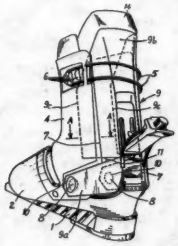


1. Device for tightening a foot in a boot (1) having a rigid shell and containing an inner slipper (3), particularly for the practice of skiing, comprising
(a) a screw-nut system (12, 11) actuatable by a user;
(b) a strap (5) arranged transversely of said boot (1) and having a lower end (6) attached to a lower interior portion of said boot;
(c) a small, substantially rectangular transmission rod (9) articulated at one (10) of its sides to a nut (11) of said screw-nut system, and connected at a side (8) opposite said one side to an upper end (7) of said strap (5);
(d) whereby displacement of said nut (11) transversely of said boot (1) is transmitted via said rod (9) to said upper end (7) of said strap (5), causing the same to move along an upper contour (14) of said slipper (3) corresponding to a selected region for tightening said foot.

4,575,957
REAR ENTRY SKI BOOT

Roland Petrini, Chambery, France, assignor to Salomon S.A., Annecy, France

Filed Jun. 4, 1984, Ser. No. 617,204
Claims priority, application France, Jun. 8, 1983, 83 09487
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—121 **4 Claims**

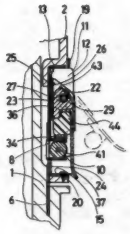


1. Rear entry type ski boot having a shell, comprising
(a) an upper comprising a forward cuff (4) having edges (7) and solid with said shell and open to the rear, and a rear hood (9) swingable about two axes of articulation (8) located on either side of the lower portions of said shell, said cuff and hood being assembled to one another by a single tightening means located near the top of said upper;
(b) said rear hood comprising an upper, channel-shaped portion (9*b*) for insertion into said cuff between said edges of the latter, and a yoke-shaped lower portion (9*a*) covering the lower portion of said edges (7) of said cuff (4) and pivotally attached to the exterior of said cuff on said axes of articulation (8), a join between said portions (9*b*, 9*a*) straddling, on each side, the corresponding edge of said cuff;
(c) said upper portion (9*b*) extending inside said boot, substantially to the level of said lower portion (9*a*) outside said boot.

4,575,958
SKI BOOT

Simon Arieh, and Guy Courvoisier, both of Geneva, Switzerland, assignors to Lange International S.A., Fribourg, Switzerland

Filed Jul. 30, 1984, Ser. No. 635,900
Claims priority, application Switzerland, Aug. 29, 1983, 4711/83
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—121 **11 Claims**

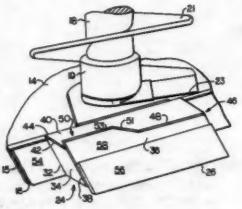


1. A ski boot consisting of at least a lower portion adapted to encompass the foot and of an upper pivotally connected to said lower portion, and comprising at the rear means for interconnecting said upper and said lower portion, said interconnecting means being located in a notch formed in one portion of the upper which surrounds at least partially said lower portion of the boot, said interconnecting means comprising a lever adapted to be set in at least two positons, a first position in which said upper is turned down for engagement with the boot, so that said upper is fastened to said lower portion with a predetermined angle of cant, and a second or raised position in which said upper can pivot freely within certain limits with respect to said lower portion, means being provided for altering the angle of cant of said upper in said first position, wherein said interconnecting means comprise a rack rigid with, and extends along, said upper, a lever having an eccentric hub journalled about a horizontal trunnion mounted in two lateral guide means parallel to, and formed in two side wall rigid with, said rack, in which said trunnion can move in a direction parallel to said rack, a strap mounted on said trunnion and having a toothed central face registering with said rack, a male element rigid with said lever and cooperating by mutual engagement with a female element rigid with said lower portion of the boot, or inversely, said lever being adapted to be set in three specific positions, namely a first position in which said lever is turned down on the boot and its eccentric hub urges said strap against said rack and said male and female elements are partially engaged into each other, a partially raised position in which said male and female elements are released from each other but said eccentric hub is still bearing against said strap, and a position in which said lever is raised by at least 90 degrees and wherein said strap is not urged against said rack.

4,575,959
MATERIAL DIRECTING DEVICE FOR AN AUGER SCRAPER

James E. Gee, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 30, 1984, Ser. No. 605,542
Int. Cl.[4] E02F 3/62
U.S. Cl. 37—4 5 Claims



1. A material directing device for an auger scraper including a bowl providing a floor having an elongated transversely oriented main cutting edge with at least one screw auger rotatably mounted in upstanding relation within the bowl, said auger having a spiral flight providing a lower leading edge located in closely spaced relation to said bowl floor and in overhanging relation to said main cutting edge which defines a material compaction zone between said lower leading edge of the auger and said bowl floor as the leading edge sweeps along the main cutting edge and rearwardly into the bowl, the material directing device comprising;

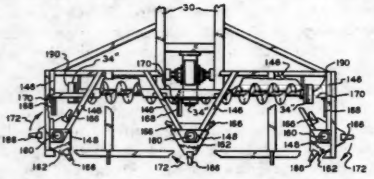
an auxiliary cutting edge; and

mounting structure means for supporting said auxiliary cutting edge in forwardly spaced longitudinally aligned relation to said auger and in parallel forwardly located relation to said main cutting edge, said mounting structure means defines a guiding surface for directing material uniformly upwardly in parallel relation to said cutting edge past said compaction zone located between the leading edge of the auger and the bowl floor, and onto the flight of the auger above said lower leading edge of the auger.

4,575,960
DREDGE CUTTERHEAD

Troy M. Deal, 277 Trismen Ter., Winter Park, Fla. 32789

Continuation of Ser. No. 472,974, Mar. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 221,219, Dec. 30, 1980, abandoned. This application Nov. 7, 1984, Ser. No. 669,058
Int. Cl.[4] E02F 3/88
U.S. Cl. 37—63 2 Claims

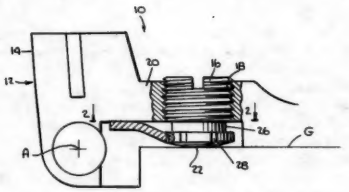


2. Dredging apparatus comprising flotation structure, a cutterhead mounted on the forward end of said structure, means on said cutterhead for cutting a swath of one width in an interface between consolidated soil and a water source and for moving a slurry along paths angularly disposed to the longitudinal axis of said swath toward an intake zone, said means for cutting a swath including a plurality of horizontally disposed rotating shafts having cutting elements mounted thereon, and each having outer ends and a central region, a vertically oriented case defined on said cutterhead at each outer end and at said central region of said shafts rotatably supporting said shafts and housing shaft bearing and drive means, a plurality of jets mounted on each case for directing high pressure water jets in a forward direction of said cutterhead, said jets being vertically spaced along the entire vertical dimension of the associated case, and suction means defining an intake zone rearwardly of said shafts' central region.

4,575,961
GUNSIGHT ELEVATING APPARATUS

Richard Mikuta, East Hampton, Mass., and Roger Curran, Stratford, Conn., assignors to Bangor Punta Corporation, Greenwich, Conn.

Filed Sep. 9, 1983, Ser. No. 530,559
Int. Cl.[4] F41G 1/16
U.S. Cl. 42—1 S 6 Claims



1. Apparatus for adjusting the elevation of the sight on a gun comprising:

a movable sight body for securement to a gun,

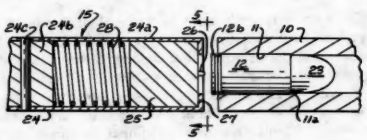
a sight elevation adjusting screw threadedly engaged with said sight body and cooperable with the gun for displacing said sight body relative to the gun in response to threading said screw relative to the sight body, said adjusting screw having an annular groove and a plurality of indentations circumferentially spaced about said screw, and

a generally U-shaped clip having a pair of laterally spaced legs engageable in said groove for retaining said clip in engagement with said screw and preventing removal of said screw from said sight body, said clip having a detent disposed between said clip legs for engaging in said indentations and detenting said screw in an adjusted threaded position thereof, and said body having means for retaining the clip against rotation.

4,575,962
UNITARY BOLT FACE AND FIRING PIN DEVICE

Michael Rogak, Antioch; Leonard W. Golan, Winnetka; Charles Witbeck, Mundelein, and Stephen L. Golan, Chicago, all of Ill., assignors to Hawk Industries, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 290,606, Aug. 6, 1981, Pat. No. 4,462,179. This application Mar. 16, 1984, Ser. No. 590,011
The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.
Int. Cl.[4] F41C 11/00; F41D 7/08
U.S. Cl. 42—1 Q 10 Claims



1. A unitary bolt face and firing pin device for a firearm having a chamber for receiving a cartridge, one end of said cartridge having a primer, and a bolt face and firing pin device

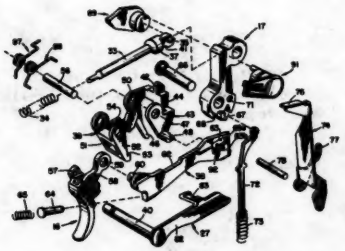
facing said chamber adapted for striking said primer end, said device comprising: a body movable toward and away from said chamber, a contact block at one end and within the confines of said body facing said chamber, a recess in said body aligned over said contact block adapted to bear upon said cartridge end at multiple points thereof, spring means in said body biasing said contact block toward said chamber for snugly engaging said cartridge end and seating said cartridge in firing position in said chamber, and firing pin means integral with and arranged centrally of said block projecting therefrom in alignment with said cartridge end adapted for firing said cartridge when said firing pin means strikes said cartridge end.

4,575,963

PISTOL MECHANISM FOR BLOCKING FIRING PIN

William B. Ruger, Croydon, N.H., and Roy L. Melcher, Stratford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Jun. 25, 1984, Ser. No. 624,185
Int. Cl.⁴ F41C *17/04*
U.S. Cl. 42—70 F **6 Claims**



5. In a semi-automatic pistol having a reciprocating slide with firing pin mounted therein, a trigger, a trigger bar, a firing pin blocking piece, a sear and a hammer, the improvement in which

(a) the firing pin blocking piece is pivotably operable to block the firing pin in all operable positions of the trigger bar except the just-prior-to-firing position and the firing position; the firing pin blocking means in turn comprising

(i) a housing including two spaced apart flange elements and a central body section between the two flange elements;

(ii) a firing pin blocking projection upstanding from the central body section;

(iii) a lug projection extending from a flange element engageable at times with the trigger bar;

(b) an opening in the trigger bar to receive the blocking piece lug which opening is configured such that as the trigger bar moves through its cycle the blocking piece lug is activated to rotate the blocking piece only just prior to and during the descent of the hammer; and

(c) a sear nested between the flange elements of the blocking piece which sear is rotated by rotating the blocking piece to release the hammer for its descent to strike the firing pin and fire the pistol.

4,575,964

GUN REST

Donnie R. Griffin, Emerson, Ark., assignor to PKG Trading Company, Inc.

Filed Apr. 25, 1984, Ser. No. 603,773
Int. Cl.⁴ F41C *29/00*
U.S. Cl. 42—94 **20 Claims**

1. A portable gun rest comprising first and second oppositely directed substantially U-shaped saddle members on opposite ends respectively of an elongate support assembly, one of said saddle members being effectively shaped and dimensioned to fit on a user's thigh, and the other of said saddle members being

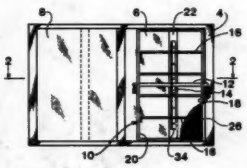
effectively shaped and dimensioned to receive a rifle forearm and the like.

4,575,965

SECURITY GRILLE APPARATUS FOR DOORS AND WINDOWS

Elmer A. Iversen, Theatre Dr. 2, Paso Robles, Calif. 93446

Filed Dec. 20, 1984, Ser. No. 684,380
Int. Cl.⁴ E06B *7/00*
U.S. Cl. 49—50 **6 Claims**



1. Apparatus for securing a window that has a slidable sash mounted in a window frame, said apparatus comprising:

a grille including a set of parallel bars and attached to the window frame with said parallel bars extending in the direction of motion of the slidable sash; and,

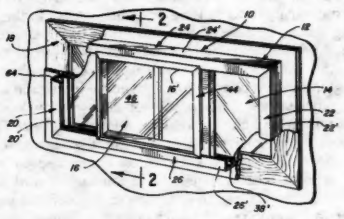
a flange extending from said slidable sash into the space between the parallel bars and including clearance holes that permit the parallel bars to extend through said flange so that said flange is slidable along said parallel bars.

4,575,966

MAGNETICALLY SEALED SLIDING WINDOW ASSEMBLY

John T. Gerritsen, Hanover Park, Ill., assignor to Jarrow Products, Inc., Chicago, Ill.

Filed Aug. 27, 1984, Ser. No. 644,933
Int. Cl.⁴ E05D *15/10*
U.S. Cl. 49—209 **14 Claims**



1. A sliding window system comprising a perimetric frame

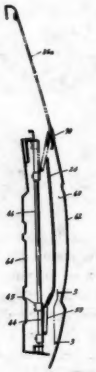
including channel means and at least one double faced panel received within said channel means for sliding movement therein, cooperable longitudinally disposed magnetic means within said channel means and carried by said panel for establishing a sealed engagement therebetween on a static condition of the panel to immobilize said panel and being disengageable in a slidable condition of the panel offset vertically from the static condition to permit sliding movement of said panel, said magnetic means comprising elongate magnets poled longitudinally, means for adhering said magnets to said panel on one face thereof adjacent the edges thereof and pull means on the opposite face of said panel capable of being grasped for translating said panel in a first direction to disengage said magnets displacing said panel to the slidable condition, and thereafter to enable translation in a second direction to a selected location along the length of said channel means, said latter means being releasable to reestablish said sealed engagement at the selected location.

4,575,967

FLUSH GLASS WINDOW REGULATOR

David J. Bickerstaff, West Bloomfield, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Jun. 22, 1984, Ser. No. 623,452
Int. Cl.[4] E05F *11/52, 11/38*
U.S. Cl. 49—211 **11 Claims**



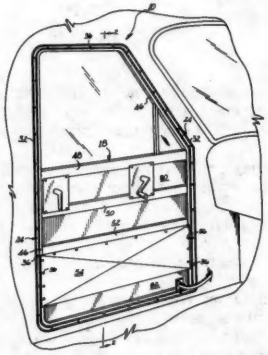
1. A vehicle window construction comprising a generally continuous outer panel having a window opening therein defined by top, side and bottom edges, said panel forming the outer wall of a cavity for receiving a window glass movable into and out of said cavity through the bottom edge of said window opening, sealing means surrounding the window opening including a bottom seal having an inwardly facing sealing surface, guide means for guiding the upper edge of said window glass continuously upward into engagement with the sealing means at the upper edge of said window opening and for guiding the lower edge portion of said glass first upwardly into substantially closed position and then upwardly and laterally outwardly into sealing engagement with the inwardly facing sealing surface of said bottom seal to position the outer surface of the lower portion of said glass substantially flush with the outer panel surface beneath said window opening, said guide means comprising a main guide portion continuous from adjacent an upper corner of said window opening to a point within said cavity adjacent a lower corner of said glass when in fully lower position, said guide means having a separate short diversion guide portion connected to said guide portion intermediate its ends and angled upwardly and outwardly therefrom adjacent the lower edge of said opening, an upper follower carried by said glass adjacent an upper corner thereof and movable along said main guide portion and including means which prevents said upper follower from following said short diversion guide portion, a lower follower movable along said main guide portion below said short diversion guide portion and adapted to follow said short diversion guide portion, means connected to the lower edge of said window glass and adapted to raise said glass and to bias the lower edge of said glass outwardly to cause said lower follower to enter and follow said short diversion guide portions, said short diversion guide portion being shaped to move the lower edge of said glass outwardly into engagement with the inwardly facing sealing surface and to position the outer surface of said glass as a continuation of the outer surface of said panel beneath said window opening.

4,575,968

VEHICLE DOOR ASSEMBLY

James G. Mariel, Mishawaka, Ind., assignor to Excel Industries, Inc., Elkhart, Ind.

Filed Nov. 14, 1983, Ser. No. 550,785
Int. Cl.[4] B60J *5/04*
U.S. Cl. 49—502 **5 Claims**



1. A door assembly for installation in a vehicle, said vehicle including a wall, said wall having an opening formed therein, said door assembly including a frame, hinge means for supporting a door in said frame, the improvement wherein said door frame includes first and second sections, each first and second door frame section having a flange, said first door frame section fitting into said vehicle wall opening with its said flange abutting one side of the vehicle wall, said second door frame section confronting said first door frame section at said wall opening with its said flange abutting the other side of said vehicle wall, said first door frame section being connected to said second door frame section to compress said vehicle wall therebetween, and said door includes an outer circumferential frame, an upper cross brace connected to said circumferential frame, a first flange at an outer edge of said circumferential frame and said upper cross brace, and a second flange at along said circumferential frame and upper cross brace spaced from and adjacent to said first flange to form a channel, and an outer door panel fitted at its peripheral edges into said channel.

4,575,969

GRINDING MACHINE FOR PUNCHING TOOLS

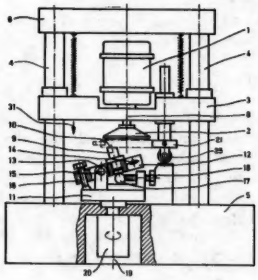
Hans Klingel, Moglingen, and Erich Brekle, Benningen a.N., both of Fed. Rep. of Germany, assignors to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,606

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234215

Int. Cl.[4] B24B 5/00

U.S. Cl. 51—131.1 18 Claims



1. In a surface grinding machine for punches, dies and like cutting tools, the combination comprising:

A. a base;

B. a workpiece holder supported on said base for rotation about an axis and including a support fixture for holding the cutting tool to be ground and which is movable into angular positions relative to said base;

C. a carrier member;

D. means on said base supporting said carrier member above said workpiece holder for movement relative to said base and said workpiece holder; and

E. a grinding disc assembly carried by said carrier member including a grinding disc below said carrier member and aligned with said support fixture and a motor for rotating said grinding disc about an axis parallel to that of said workpiece holder, said workpiece holder being movable to bring the surface of a tool supported therein into a predetermined position relative to said grinding disc.

4,575,970

METAL STRIP EDGE GRINDING APPARATUS

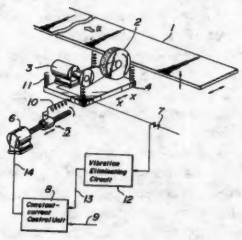
Shinji Kozai; Suenobu Shiiba, both of Kobe, and Yoshitaka Higashitani, Tokyo, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 18, 1984, Ser. No. 631,989

Claims priority, application Japan, Sep. 10, 1983, 58-165883[U]

Int. Cl.[4] B24B 9/04

U.S. Cl. 51—165.92 1 Claim



1. An apparatus for grinding edges of running metal strips by a rotating grinding wheel comprising a grinding wheel supporting table carrying thereon said grinding wheel, a motor for driving said grinding wheel mounted on said table, driving means for forward and backward driving said table toward and away from the edges of the metal strips, resiliently urging means arranged between said table and said driving means, a plurality of springs for suspending said table and cooperating with said resiliently urging means to bring said grinding wheel into resilient contact with the edges of the metal strips, load current detecting means for detecting a load current of said motor for driving said grinding wheel, a vibration frequency eliminating circuit for receiving load current signals from said load current detecting means, cutting off vibration components of the received signals, and generating signals representative of only load current for grinding, and a constant current control unit for receiving signals representative of only load current for grinding, comparing the received signal with a set value signal for grinding current and ge nerating in response to a compared result a control signal for controlling said driving means for forward and backward driving said table so as to substantially reduce the variation in load current of said motor for driving said grinding wheel and substantially eliminate uneven grinding of the edges of the metal strips, said resiliently urging means comprising a spring and said driving means comprising a feeding screw, a motor for rotatively driving the feeding screw and a nut threadedly engaged with the feeding screw and connected to said table through said spring of said resiliently urging means, said spring having one end thereof connected to said table and the other end thereof connected to the nut.

4,575,971

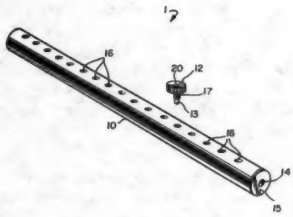
DEVICE FOR HOLDING AND AIDING IN THE SHARPENING OF WELDING RODS

Jerry L. Keneson, 3200 Hospital Rd., #34, Tacagoula, Miss. 39567

Continuation-in-part of Ser. No. 442,303, Nov. 17, 1982, abandoned. This application Oct. 31, 1983, Ser. No. 546,951

Int. Cl.[4] B24B 5/18

U.S. Cl. 51—236 18 Claims



1. A device for assisting in the sharpening of an end of an elongated workpiece, said device comprising:

an elongated member including means defining an axial cavity into which one end of said workpiece is receivable, means defining an interior surface bounding said cavity, and means defining plural axially spaced apart apertures transverse to and communicating with said cavity; and

adjusting means, selectively engageable with any selected one of said apertures and movable between said selected one and another one of said apertures, for adjusting the length that another end of said workpiece is exposed beyond the terminal end of said member, said adjusting means including means defining a determining nib occluding substantially all of a cross-section of said cavity when said adjusting means is engaged with said selected aperture, said workpiece one end abutting against said determining nib, said nib including means for permitting said workpiece to axially spin in contact with said interior surface and said nib to thereby evenly sharpen said an-

other end of said workpiece when said member is manually brought into sharpening proximity with a sharpening tool, said spin-permitting means including means defining a smooth, convex curved surface terminating in a hemispherical portion, said terminating hemispherical portion contacting said interior surface at a point on said interior surface opposite said selected aperture when said adjusting means is engaged with said selected aperture.

4,575,972

GRINDING MACHINE FOR USE WITH ROLLING MILL

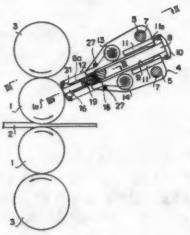
Toshio Ohki; Masaomi Matsumoto, both of Chiba; Takashi Sakuraya, Higashimurayama; Keinosuke Tokushige, and Shuji Hoshino, both of Funabashi, all of Japan, assignors to Kawasaki Seitetsu Kabushiki Kaisha, Hyogo and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 6, 1984, Ser. No. 577,248

Claims priority, application Japan, Feb. 25, 1983, 58-29236

Int. Cl.[4] B21B *28/02*; B24B *21/02*

U.S. Cl. 51—251 **17 Claims**



1. A grinding machine for use with a rolling mill having a work roll with a longitudinal axis, comprising: a main body, means for displacing said main body essentially parallel to said axis, a supporting rod slidably mounted in said main body so as to be movable transverse to said axis and having a leading end, an abrasive belt mounted on said main body and supported by said leading end of said supporting rod, and means for extending or retracting said supporting rod relative to said main body, for pressing said abrasive belt against a circumferential rolling surface of said work roll.

4,575,973

GRINDING MACHINE

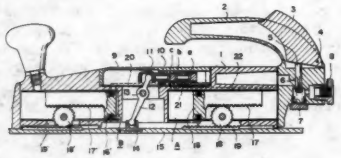
Nobuyuki Izumisawa, 2-19-27, Azusawa, Itabashi-ku, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,097

Claims priority, application Japan, Jun. 22, 1983, 58-110990

Int. Cl.[4] B24B *23/04*; F01L *31/04*; B23D *67/00*

U.S. Cl. 51—170 TL **1 Claim**



1. A grinding machine comprising:

a main body;

a directional control valve case provided on said main body;

a directional control sleeve fixedly secured within said directional control valve case;

a valve for feeding compressed air into said directional control sleeve;

first and second cylinders provided within said main body at front and rear ends thereof;

a directional control valve slidable back and forth within said directional control sleeve for communicating said first and second cylinders;

first and second pistons for reciprocating within said first and second cylinders, respectively;

first and second rack gears provided on said first and second pistons, respectively;

first and second pinions meshing with said first and second rack gears, respectively;

an operating plate having a grinding body attached to a lower surface thereof;

third and fourth rack gears provided on said operating plate and meshing with said first and second pinions **18**, **18'**, respectively, for reciprocating said operating plate;

a guide provided on said operating plate; and

a valve operating arm **12** having one end engaging said guide and another end engaging said directional control valve, said valve operating arm being pivotally supported on said main body by a pin for switching said directional control valve in response to reciprocation of the said operating plate.

4,575,974

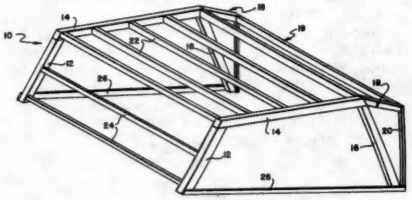
BUILDING STRUCTURE

William H. Porter, P.O. Box 249, Saugatuck, Mich. 49453

Filed Mar. 19, 1984, Ser. No. 591,266

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—86 **14 Claims**



1. A building structure comprising:

a pair of parallel, linear, inclined forward support columns, each fixedly positioned at a lower end thereof;

a pair of parallel, linear, aft support columns, each fixedly positioned at a lower end thereof and inclined toward a respective forward support column;

a pair of linear, nonhorizontal trusses, each securely coupled at a respective end thereof to the upper end portions of a forward support column and an aft support column;

a plurality of first purlins coupled at respective ends thereof to a respective one of said trusses along the length thereof;

at least one second purlin securely coupled at respective ends thereof to one of said aft support columns;

a generally vertical frame mounted to the forward portion of the building structure and extending substantially the width thereof;

a rear wall positioned upon and supported by said aft support columns and said at least one second purlin; and

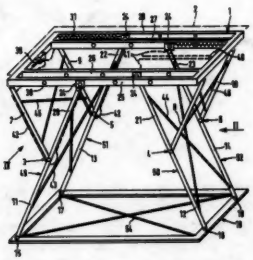
a roof panel positioned upon and supported by said plurality of first purlins and trusses and said vertical frame, said roof panel including a single roof section having an angled ridge portion defined by the joinder of the building structure and said generally vertical frame mounted to a forward portion thereof.

4,575,975

PORTABLE PLATFORM TRESTLE FOR STAGES, PLATFORMS, PEDESTALS OR THE LIKE

Hans J. Eisenberg, Iriebelsheide 59, 5600 Wuppertal 1, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,510
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412549
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—109 16 Claims



1. A portable platform trestle for assembly with similar platform trestles to form stages for public events,

the platform trestle being manually adjustable as to height and adapted to be folded up into a flat package stackable with similar folded platform trestles to compact storage piles, comprising

a platform, carried by a rectangular upper frame means,

a lower frame means,

four scissors, each made up of a long leg and further of an arm articulated with one end at the middle part of the leg, each scissors being articulated within the reach of corresponding trestle corners with the other end of said arm at the upper frame means and with the lower end of said leg at the lower frame means, the upper end of said leg being movable,

wherein all of said four scissors are arranged side by side and respectively two of the scissors are arranged by pairs of respectively outer and inner scissors at the longitudinal sides of the platform trestle, the two outer scissors and the two inner scissors being articulated at opposite front sides of the platform trestle,

four parallel scissor guideways, provided at the upper frame,

four slide means, each running along one of said guideways and being connected with the upper movable end of the leg of the respective scissors,

arresting means for arresting the slide means at the guideways and thereby adjusting the height of the platform,

operating means arranged at the front sides of the platform trestle for actuating the arresting means during the manual height adjustment of the platform,

flexible force transmission means connecting the operating means and the arresting means, the transmission means for the arresting means of the two outer scissors being installed along the arm and the upper part of the leg of the respective scissors,

a first cross bracing means between the legs of the two inner scissors, and

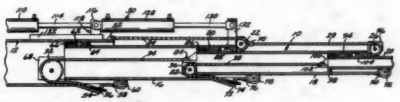
a second cross bracing means between the legs of the two outer scissors, wherein the second cross bracing means defines a passage for receiving the inner scissors, folded between the legs of the outer scissors.

4,575,976

EXTENSION AND RETRACTION SYSTEM FOR BOOM APPARATUS

Charles McDermott, Lakewood, and Magbool A. Zafar, Fontana, both of Calif., assignors to Machine Products Corporation, Kansas City, Kans.

Filed Jun. 24, 1983, Ser. No. 507,349
Int. Cl.[4] E04H *12/34*
U.S. Cl. 52—118 11 Claims



1. In a boom apparatus comprising elongated, telescoping boom sections, certain of said sections being extensible and retractable relative to a base section adapted for mounting to a mobile platform for pivotal movement about a horizontal axis, said certain sections including an inner section carried by said base section; an intermediate section carried by said inner section; an outer section carried by said intermediate section; an inner extension sprocket carried by said inner section; a base-to-intermediate extension chain trained about said inner extension sprocket and attached at its opposite ends to said base and intermediate sections, respectively; an intermediate extension sprocket carried by said intermediate section; and an inner-to-outer extension chain trained about said intermediate extension sprocket and attached at its opposite ends to said inner and outer sections, respectively, an improved extension and retraction system comprising:

an inner retraction sprocket carried by said inner section;

a base-to-intermediate retraction chain trained about said inner retraction sprocket and attached at its opposite ends to said base and intermediate sections, respectively;

an intermediate retraction sprocket carried by said intermediate section;

an inner-to-outer retraction chain trained about said intermediate retraction sprocket and attached at its opposite ends to said inner and outer sections, respectively, said means for extending being further actuable for retracting said inner section whereby said intermediate and outer sections are automatically retracted through the action of said base-to-intermediate and inner to outer retraction chain; and

a fluid actuated boom extension cylinder assembly including a longitudinally extending guideway fixed to said base section, an inner mount longitudinally slidably carried by said guideway, an outer mount fixed to said inner section, an inner cylinder connected to said inner mount and actuable to outwardly slide said inner mount along said guideway, an outer cylinder connected to said inner mount and to said outer mount and actuable to extend said inner section for automatically extending said intermediate and outer sections.

4,575,977

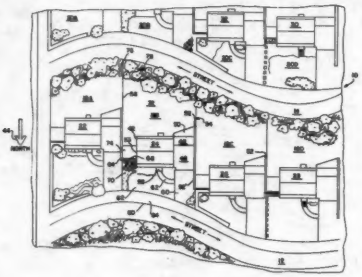
HOUSING DEVELOPMENT BUILDING ARRANGEMENT

Lawrence H. Taylor, P.O. Box 49-58, 48th Street Sta., Union City, N.J. 07087

Continuation-in-part of Ser. No. 644,455, Aug. 27, 1984. This application Apr. 22, 1985, Ser. No. 725,758
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—169.3 4 Claims

1. A housing land and fencing arrangement for at least two adjacent streets having particular utility for houses having solar energy collecting panels positioned on the south facing part of the house; each of the at least two adjacent streets being directed in a generally east and west direction and serving a

plurality of adjacent lots; each of said lots having north and south directed side boundaries into walls of said boundaries adjacent to the buildings and adapted to receive a single north facing house with the rear thereof supporting south facing



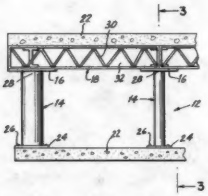
solar collecting panels; a wooded screen acting as a wind, privacy and security barrier of substantial depth parallel to the southern property line along the north side of each of the at least two adjacent streets.

4,575,978

POLE SHELL BUILDING

John H. Huhn, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Mar. 28, 1984, Ser. No. 594,368
Int. Cl.[4] E04B *1/18*
U.S. Cl. 52—234 **1 Claim**



1. A pole shell building having a plurality of floors wherein each floor comprises:

(a) a plurality of pole shell columns, each column affixed at bottom to concrete slab;

(b) a plurality of support plates, each plate affixed to top of each column;

(c) a plurality of trusses, each truss supported at short spans between two support plates; and

(d) a plurality of beams, each beam supported at long spans between two support plates; and

(e) a concrete slab supported by the trusses and beams;

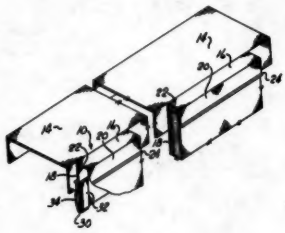
(f) a means for adjusting plate elevation wherein each support plate further includes a collar affixed to underside having a plurality of reinforcement ribs formed thereof at the underside of said plate extending from the collar to the edges of said plate to reinforce said plate, said collar fitting over the top of each column for easy assembly, in further combination with shims fitting inside said collar to engage said columns.

4,575,979

BRACKET ASSEMBLY FOR SECURING WALL MEMBERS

Leonardo Mariani, 2528 Penn Ave., Pittsburgh, Pa. 15222

Filed Aug. 8, 1984, Ser. No. 638,910
Int. Cl.[4] E04B *2/74*
U.S. Cl. 52—24 **1 Claim**



1. In combination with a channel type ceiling track used in forming room partitions, a bracket assembly for securing a planar wall member to the ceiling track, comprising:

a housing having first and second spaced apart generally parallel elongated face members, and a flange member interconnecting said face members at one of their respective ends to define an opening at the other of the respective ends of the face members and said first and second face members and said flange member being constructed and arranged such that at least a portion of the upper section of a planar wall member may be snugly and slideably received within the confines defined by said members;

said first and second face members having respective height dimensions considerably less than their respective length dimensions;

said first face member having a height dimension greater than the height dimension of said second member, whereby said housing has a generally J-shaped cross-section;

a lip member fixed to the free end of said second face member and extending at an acute angle away from the confines defined by said face members and said flange members; and

at least one clip means removable from and engagable with said first face member of said housing for securing said housing to a side section of the ceiling track, said clip means having a planar front face and a curved rear face pivotably joined at one end to said front face, and said rear face being spring-biased in the direction of said front face.

4,575,980

APPARATUS AND METHOD FOR STRAIGHTENING WARPED DOORS

George C. Shuler, 2116 Gilmore Dr., Fort Wayne, Ind. 46818

Filed Nov. 9, 1984, Ser. No. 670,343
Int. Cl.[4] E04G *23/00*
U.S. Cl. 52—291 **20 Claims**

1. An apparatus for straightening warped doors, said apparatus comprising:

an elongate member having opposite end portions, said opposite end portions adapted for mounting said elongate member on a warped door;

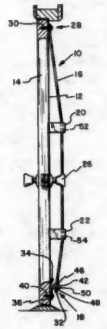
means on said elongate member for adjusting the length of said elongate member between said opposite end portions; and

spaced pressure block means slidably mounted on said elongate member for pressing against a selected portion of a warped door and for increasing tension on said elongate member by causing said elongate member to bow outwardly and pull the warp out of the door, said pressure block means each including a plurality of sides and an opening therethrough posi-

tioned closer to one of said sides than to another of said sides, said opening slidably receiving said elongate member therethrough and enabling said spaced pressure block means to rotate about the axis of said elongate member.

14. A method for straightening a warped door, comprising the steps of:

anchoring opposite end portions of an elongate member to top and bottom end portions of a warped door, said elongate member having spaced pressure block means including a block having a plurality of sides and an opening therethrough closer to one of said sides than to another of said



sides, said opening slidably and rotatably receiving said elongate member;

adjusting the length of said elongate member between said opposite end portions;

sliding and positioning said spaced pressure block means over the warped portion of the door; and

then rotating said spaced pressure block means to positions bridging between said elongate member and said warped portion of the door to increase tension on said elongate member by bowing said elongate member outwardly away from the door and causing said spaced pressure block means to press against said door to straighten out the warp.

4,575,981

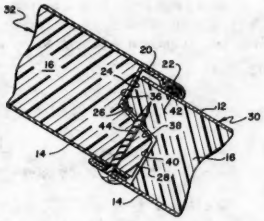
ROOF PANEL CONSTRUCTION

William H. Porter, P.O. Box 249, Saugatuck, Mich. 49453

Filed Feb. 13, 1984, Ser. No. 579,681

Int. Cl.[4] C04D *1/00*

U.S. Cl. 52—309.9 **9 Claims**



1. A shiplapped joint between first and second edge-abutting panels each having upper and lower faces and a core material therebetween for use in a pitched roof including said first and second panels, wherein said first panel is positioned higher on the pitched roof than the second panel, said joint comprising:

an extended edge portion of the upper face of said first panel and an extended edge portion of the lower face of said second panel wherein said respective edge portions of each of said first and second panels are mutually complementary in configuration and each overlaps the immediately adjacent, abutting portion of the other panel;

a recessed portion located on an inner edge portion of the upper face of said first panel and extending the length thereof, said recessed portion adapted to receive a sealant positioned therein; and

coupling means inserted through the extended edge portion of the lower face of said second panel for engaging an overlapping edge portion of said first panel in abutting contact with a corresponding overlapping edge portion of said second panel and for displacing said second panel upward whereby said sealant is compressed in tight fitting relation between the extended edge portion of the upper face of said first panel and said overlapping edge portion of said second panel and seals said joint.

4,575,982

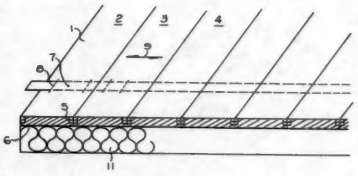
PANEL UNIT

Hans Wenger, CH-8574, Lengwil/TG, Switzerland

Continuation-in-part of Ser. No. 409,143, Aug. 18, 1982, abandoned. This application Nov. 28, 1984, Ser. No. 675,614

Int. Cl.[4] E04B *1/38, 1/62*

U.S. Cl. 52—509 **8 Claims**



1. A panel unit including a plurality of boards fitted together by tongue-and-groove elements, adapted to be applied to a wall with other panel units in mutual edge-to-edge engagement, and having an outer surface, and an inner surface directed to the wall,

characterized in that,

a fastening strip is secured to said inner surface, extending across the long axes of the boards,

a mat of insulating material is glued to said inner surface,

mounting screws are secured in the wall adjacent to but outwardly beyond the edge of a panel unit, extending transverse to the plane of the panel unit and wall and confined between said inner surface and the wall, and thereby covered by the adjacent panel unit,

the fastening strips on adjacent panel units have mutually oppositely directed offsets of differet depths, extending parallel to the inner surface of adjacent panel units, an inner offset being adjacent the wall and an outer offset adjacent to but spaced from said inner surface,

said offsets having slotted end elements engaging the securing screw spaced apart substantially the thickness of the mat of insulating material.

4,575,983

SLIDING HOLD-DOWN CLIP FOR STANDING SEAM METAL ROOF

Hamilton Lott, Jr., Fort Wayne, and Lynn E. Strock, Waterloo, both of Ind., assignors to Nucor Corporation, Charlotte, N.C.

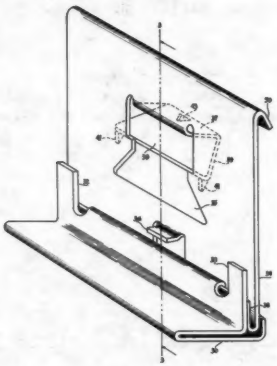
Filed Feb. 1, 1985, Ser. No. 697,148

Int. Cl.[4] E04D *1/34*

U.S. Cl. 52—544 **5 Claims**

1. In a standing seam roof for an infrastructure, said roof having a pair of adjacent roof panels formed with interleaved upwardly directed portions providing a standing seam, a compound clip having a lower base part adapted to be attached to

said infrastructure and an upper hold-down part, said hold-down part positioned between said adjacent upwardly directed roof panel portions and coacting with said seam to prevent the seam from moving upwardly away from the hold-down part of said clip, a slidably interlocking joint between said hold-down part and said base part adapted to permit sliding motion between said upper and lower clip parts, means carried by said upper clip part to prevent relative longitudinal movement between said roof panel seam and said upper clip part, a projection carried by said upper clip part, a pair of stops positioned on opposite sides of said projection and adapted to coact with said projection to limit its sliding motion, and means for fixing



one point of each of said roof panels against longitudinal motion while allowing the opposite points of the panels floating movement owing to thermal expansion and contraction, the distance between said projection and the stop nearer the floating points of the panel being less than the distance between said projection and the stop nearer the fixed point of the panel, the construction being such that it will accommodate excessive thermal expansion by allowing the roof panels to buckle, thus preventing permanent damage to the roofing system, while permitting contraction without placing the roof panels in tension, thus also preventing permanent damage to the roofing system.

4,575,984

CONSTRUCTION ELEMENT

Gijsbert Versteeg, Nunspeet, Netherlands, assignor to IMEX AG, Zurich, Switzerland

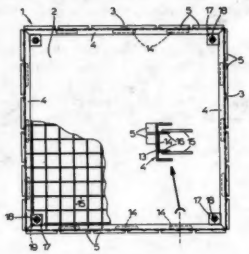
Filed Jun. 9, 1983, Ser. No. 502,744

Claims priority, application Netherlands, Jun. 16, 1982, 8202430

Int. Cl.[4] E04C *1/10, 1/30*

U.S. Cl. 52—589 **8 Claims**

1. Construction element for constructing a supporting floor or the like, comprising a slab made of reinforced concrete having an upper and a lower surface, each of the side walls of the slab being provided with an upper and lower series of aligned, alternating projections and complementary recesses, each projection having an upper and a lower surface, the bottom wall of each recess being flush with the corresponding side wall of the slab, wherein the recesses of the upper series lie above the projections of the lower series, wherein the recesses of the lower series lie below the projections of the upper series and, wherein the recesses and projections of the lower series lie at a distance from the lower surface of the slab, and wherein the side walls of the slab are provided with protection profiles connected with each other, the projections being carried by the protection profiles and wherein a corner plate is mounted



in each corner formed by two of said protection profiles joining each other, a hole being formed in each corner plate.

4,575,985

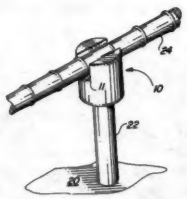
REBAR SADDLE

Richard H. Eckenrodt, 9660 N. Ridge View Pl., Oro Valley, Ariz. 85704

Filed Jun. 24, 1985, Ser. No. 747,917

Int. Cl.[4] E04C *5/16*

U.S. Cl. 52—677 **17 Claims**



1. A rebar saddle for securing and suspending above ground reinforcing bars used in strengthening concrete comprising:

an elongated solid cylinder having a first and second end, sides, and longitudinal axis;

said elongated solid cylinder first end defining a saddle formed therein adapted to receive and secure the reinforcing bar; and

said elongated solid cylinder second end defining a blind hole formed therein adapted to receive a stake driven into the ground whereby the rebar saddle suspends the reinforcing bar in position to have concrete poured around it and cured.

4,575,986

METHOD AND APPARATUS FOR PACKAGING GARMENTS

Richard A. Willett, Snellville; Fred J. Faletti, Atlanta, and Paul A. Faletti, Lilburn, all of Ga., assignors to All-Pak, Inc., Decatur, Ga.

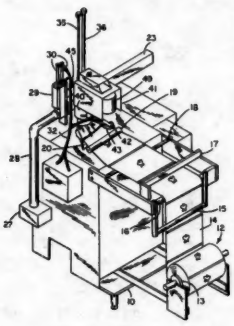
Filed Jan. 6, 1984, Ser. No. 568,704

Int. Cl.[4] B65B *63/04*

U.S. Cl. 53—118 **1 Claim**

1. Apparatus for packaging garments comprising, in combination, a generally vertically oriented tubular packing chamber; a spindle mounted for rotary movement within said packing chamber about a generally vertical axis to wind a garment about said spindle; a vacuum in-feed channel extending laterally from said packing chamber ; means for placing under vacuum said channel and packing chamber to draw a garment through said channel and into said packing chamber for bundling about said spindle; means for forming flexible packaging

material into an elongated tube that extends downwardly from said tubular packing chamber and for successively drawing, sealing and severing end portions of said tube at a fill station located beneath said packing chamber; and plunger means



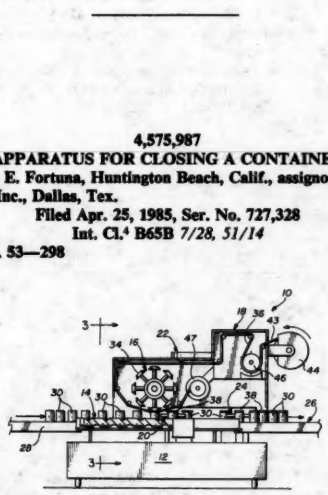
mounted for generally vertical reciprocal movement over said spindle to and from said fill station for urging in direct contact therewith bundled garments off of said spindle and down into end portions of the tube of packaging material.

4,575,987

APPARATUS FOR CLOSING A CONTAINER

Vincent E. Fortuna, Huntington Beach, Calif., assignor to Vercon, Inc., Dallas, Tex.

Filed Apr. 25, 1985, Ser. No. 727,328
Int. Cl.[4] B65B 7/28, 51/14
U.S. Cl. 53—298 **8 Claims**



1. Improved apparatus for closing and sealing the open top of a container with a cover having a heat responsive adhesive polymer thereon, said apparatus comprising in combination:

a housing;

container feed means on said housing for receiving the containers and for positioning each container;

cover applying means on said housing for locating a cover on each positioned container to close the open top;

container discharge means; and,

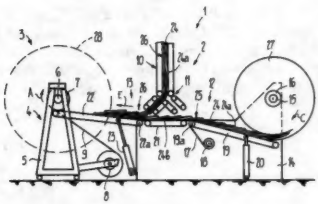
means for activating said adhesive polymer including means for moving said container from said container feed means to said discharge means.

4,575,988

METHOD AND APPARATUS FOR STORING CONTINUOUSLY ARRIVING FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, AND PRODUCT PACKAGE FORMED FROM SUCH PRODUCTS

Jacques Meier, Bäretswil, Switzerland, assignor to FERAG AG, Hinwil, Switzerland

Filed Nov. 29, 1982, Ser. No. 445,565
Claims priority, application Switzerland, Dec. 9, 1981, 7854/81
Int. Cl.[4] B65B 63/04
U.S. Cl. 53—399 **21 Claims**



1. A method of storing continuously arriving substantially flat products, especially printed products, preferably arriving in an imbricated product formation, comprising the steps of:

conveying a continuous stream of products towards a wind-up station including a wind-up location equipped with a winding core;

forming from said stream of products a leading first product portion and a subsequent second product portion;

delivering said first product portion after a predetermined delay time to said wind-up location; and

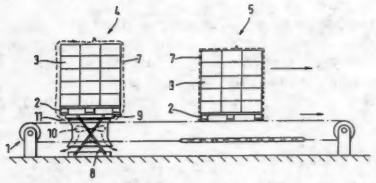
simultaneously winding-up said first product portion and said second product portion of said stream of products at said wind-up location.

4,575,989

METHOD AND DEVICE FOR PACKAGING PALLETIZED STACKS OF GOODS

Rainer W. Hannen, Goch, Fed. Rep. of Germany, assignor to MSK-Verpackungs-Systeme GmbH, Kalkar-Wissel, Fed. Rep. of Germany

Filed Oct. 15, 1982, Ser. No. 434,703
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141100; Jan. 14, 1982, 3200832; Feb. 6, 1982, 3204171
Int. Cl.[4] B65B 31/04, 53/06
U.S. Cl. 53—434 **28 Claims**



1. The method of packaging palletized stacks of goods, comprising the steps of:

(a) providing a pallet with peripheral edges and a stack of goods resting on said pallet;

(b) providing a support means disposed beneath said pallet and extending short of said edges;

(c) placing said pallet on a support disposed above said support means;

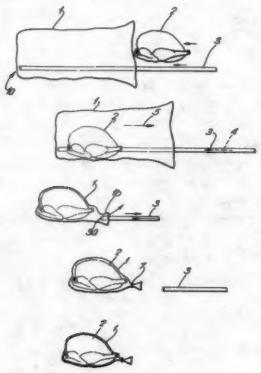
(d) raising said pallet from said support with said support means;
(e) wrapping said stack of goods with a shrink wrap material so that a portion of said shrink wrap material extends under said edges and short of said support means;
(f) lowering said pallet onto said support for thereby clamping said portion of said shrink wrap material between said support and the underside of said pallet; and,
(g) shrinking said shrink wrap material while maintaining said portion clamped for thereby tightly encasing said stack of goods onto said pallet.

4,575,990

SHRINK PACKAGING PROCESS

Gottfried von Bismarck, Lutry, Switzerland, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Jan. 11, 1985, Ser. No. 690,789
Claims priority, application United Kingdom, Jan. 19, 1982, 8401383
Int. Cl.[4] B65B *31/04*
U.S. Cl. 53—434 **16 Claims**



1. A process for packaging comprising:
(a) placing a product article in a heat shrinkable plastics bag having an opening and a closed end remote from the opening;
(b) inserting a nozzle into the bag through the opening so that the nozzle extends approximately to the closed end;
(c) flushing air from the bag interior by injecting a hot gas into the bag interior so as to impart shrinking heat to the bag thereby
(d) shrinking the region of the bag in contact with the discharging hot gas;
(e) withdrawing the nozzle to cause the regions of the bag in contact with the discharging hot flushing medium to shrink progressively as the nozzle is withdrawn as the medium contacts the bag walls; and
(f) sealing the bag to provide a heat-shrunk, at least substantially air-free, package.

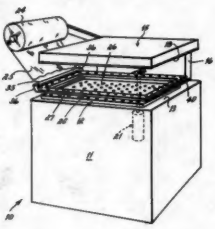
4,575,991

SKIN PACKAGING MACHINE WITH VACUUM FRAME

Alexander Hollingsworth, Anderson, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Oct. 12, 1984, Ser. No. 660,109
Int. Cl.[4] B65B *11/52*
U.S. Cl. 53—509 **6 Claims**

1. In a skin packaging machine having a base, a vacuum box having a perforated platen onto which a substrate and articles to be packages are placed, vacuum means for applying a vacuum to said vacuum box, an oven mounted to said base and overlying said vacuum box and a support for a roll of film adjacent said base, the improvement comprising
a film frame surrounding said perforated platen and mounted between said platen and said oven,
said frame being hollow and having a plurality of holes in its upper surface and spaced around said frame,



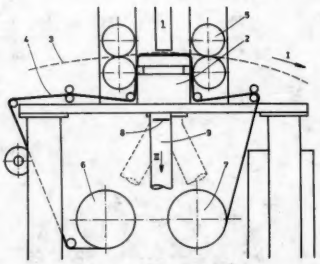
means for applying a vacuum to said frame sufficient to hold said film on said upper surface by said holes on said frame,
and means for moving said frame between a position adjacent said platen and a position adjacent said oven so that said film on said upper surface juxtaposes said oven without any interposed elements.

4,575,992

APPARATUS FOR PRODUCING CLOTH CUT OUTS FOR PACKAGING IN A CONTAINER TOGETHER WITH THE PRODUCTION AT A DIFFERENT RATE OF CLOSURE CUT OUT FOR THE CONTAINER

Jean-Francois Caumont, Brionne, France, assignor to Tempo Sanys, Paris, France

Filed Jun. 27, 1980, Ser. No. 163,706
Claims priority, application France, Oct. 11, 1979, 79 25358
Int. Cl.[4] B65B *7/28, 63/00*
U.S. Cl. 53—520 **1 Claim**



1. Apparatus for cutting out discs or other shapes from a cloth sheet, for filling containers with the cut-outs, and for cutting out a closure member of the same shape from a sheet of closure material, said apparatus comprising
(a) a die having an opening of the requisite shape,
(b) a punch arranged to cooperate with the die to cut out material disposed in the gap between the punch and the die
(c) first stepping means for stepping the sheet of cloth material through the gap between the punch and die at a first frequency, and
(d) second stepping means for stepping the sheet of closure material through the gap between the punch and die at a second frequency lower than said first frequency,
said first and second stepping means including means for causing the two sheets of material to be disposed one over the other when in the gap between the punch and the die

whereby a cloth cut out and a closure cut out are produced in one stroke of the punch followed by a sequence of strokes in which only cloth cut outs are produced.

4,575,993

MACHINE FOR PACKAGING EGGS

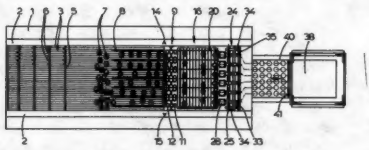
Pieter Meyn, Noordeinde 68C, 1511 AE Oostzaan, Netherlands

Filed Jun. 15, 1983, Ser. No. 504,526

Claims priority, application Netherlands, Jun. 16, 1982, 8202431

Int. Cl.[4] B65B *23/06*

U.S. Cl. 53—534 9 Claims



1. Machine for packaging eggs comprising:

means for supplying eggs arranged in successive cross rows of a predetermined number,

said eggs being equally spaced in said cross rows at a first distance between their longitudinal axes, and aligned and oriented with their blunt ends facing in the direction of supply movement,

means for supplying egg container means having egg holding recesses, said recesses being arranged in parallel cross rows of a number equal to said predetermined number of cross rows of said eggs and equally spaced in said cross rows at a second distance between their centers smaller than said first distance, and

transfer means for receiving said successive cross rows of oriented eggs to transfer said rows to successive corresponding cross rows of said egg holding recesses of said egg container means, said transfer means comprises,

(i) a horizontally extending cross row of egg holders mounted for common rotation and supported for transverse sliding movement with respect to each other,

(ii) driving means for rotating said rotatable row of egg holders between an egg receiving position and an egg discharging position, and

(iii) egg holder control means cooperating with said egg holders to shift said egg holders laterally with respect to each other during said rotating movement so that,

the centers of said egg holders in said receiving position being relatively spaced by said control means at said first distance and said egg holders facing upwards for receiving a row of said oriented eggs from said egg supply means and the centers of said egg holders in said discharging position being relatively spaced by said control means at said second distance and facing downwards for dropping the eggs received therein into said row of egg holding recesses wherein said first distance is larger than said second distance, and

a cross row of ejector means, and egg holders having an open bottom and said ejector means being arranged to project through said open bottoms of said egg holders in the egg discharging position of the latter for ejecting the eggs therefrom.

4,575,994

PACKAGE STRAPPING MACHINE

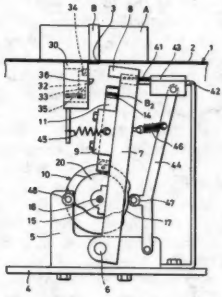
Masaho Takami, Hirakata, Japan, assignor to Shoko Kiko Co., Ltd., Shijonawate, Japan

Filed Nov. 29, 1984, Ser. No. 676,404

Claims priority, application Japan, Dec. 5, 1983, 58-229637; Jun. 30, 1984, 59-136872; Sep. 21, 1984, 59-144024

Int. Cl.[4] B65B *13/02*

U.S. Cl. 53—582 3 Claims



1. A package strapping machine comprising a top board on which a package to be strapped is loaded and having an elongated opening therein for allowing a strap which is to be strapped around a package to be pulled therethrough, a base plate disposed under said top board, a main shaft held on said base plate in parallel with the elongation of said opening, a pivotal member adapted to transversely turn pivotally on said main shaft and having a lateral projection on its upper free end for allowing an overlapping portion of said strap to be fed beneath said lateral projection parallel to said elongated opening to be pressed against the under surface of said lateral projection, the length of said lateral projection measured in the direction traversing the path along which said strap is fed being substantially equal to the breadth of said strap, two clamps and a pressing means mounted on said pivotal member under said lateral projection and adapted to move up and down so as to press said strap against the under surface of said lateral projection, a cam mechanism mounted on said pivotal member under said two clamps and said pressing means so as to impart up-and-down motion to said two clamps and said pressing means, a welding means for welding said overlapping portion, and a sidepiece secured to the under surface of said top board and having a surface flush with a longitudinal edge of said elongated opening, means for pivoting said pivotal member to an upright position so that the end face of said lateral projection contacts said surface of said sidepiece thereby forming a guideway through which the strap is inserted beneath said lateral projection.

4,575,995

AUTOMATIC PRODUCING APPARATUS OF CHIP-FORM ELECTRONIC PARTS AGGREGATE

Makoto Tabuchi, and Kiyoshi Imanishi, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 250,660, Apr. 3, 1981, abandoned. This application Apr. 13, 1984, Ser. No. 599,597

Claims priority, application Japan, Apr. 3, 1980, 55-44168; Apr. 29, 1980, 55-58103; Apr. 29, 1980, 55-58102

Int. Cl.[4] B65B *27/10, 47/00*

U.S. Cl. 53—591 21 Claims

1. Apparatus, comprising:

an intermittent feed device for intermittently feeding a tape-like housing body on a rail, said tape-like housing body having a plurality of housing holes and a plurality of feed holes formed at respective predetermined intervals

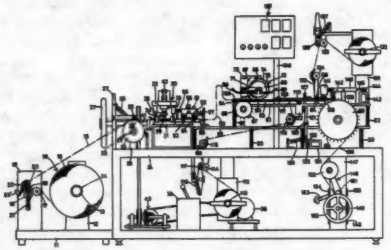
therein, said tape-like housing body being fed along said rail by feed pins of said intermittent feed device which engage said feed holes;

a loading device provided along the traveling path of the tape-like housing body and adapted to load a respective chip-form electronic part into that one of said housing holes which is located at a predetermined chip insertion position each time said tape-like housing body is in a dwell period of its intermittent feed;

a cover sheet supply device for supplying at least one tape-like cover sheet to the surface of the tape-like housing body in a manner which encloses each said housing hole after a respective chip-form electronic part has been placed therein;

a cover sheet adhering device for adhering said at least one cover sheet to said housing body so as to form a strip-like container housing chip-form electronic parts; and

a winding device for intermittently winding the strip-like container being fed from said intermittent feed device around a reel, said winding device being intermittently driven at a rate which is different than that of said intermittent feed device, said feed pins of said intermittent feed device being located downstream of said chip insertion position but upstream of said winding device relative to the path of travel of said tape-like housing body whereby said feed pins prevent forces placed on said container by said winding device from adversely affecting the relative positions of said housing hole located at said loading position and said loading device.



16. Apparatus, comprising:

(A) an intermittent feed device for intermittently feeding a tape-like housing body having a plurality of housing holes formed therein at predetermined intervals;

(B) a loading device provided along the traveling path of the tape-like housing body and adapted to load a respective chip-form electronic part into each of the housing holes;

(C) a cover sheet supply device for supplying at least one tape-like cover sheet to the surface of the tapelike housing body so as to enclose each said housing hole after a respective chip-form electronic part has been placed therein;

(D) a cover sheet adhering device for adhering said at least one cover sheet to said housing body so as to form a strip-like container housing chip-form electronic parts;

(E) a winding device for winding the strip-like container around a reel;

(F) said loading device comprising:

(1) a chip-form electronic part loading body which includes an annular rotary body having an outer peripheral surface and an inner peripheral surface, said inner cylindrical surface being rotatably fitted onto an outer peripheral surface of a circular fixed head located above said tape-like housing body, said axis of rotation of said rotary body lying perpendicular to the plane of said tape-like housing body as said tape-like housing body travels past said loading device, a plurality of chip-form electronic part housing grooves open on one side thereof being provided on said outer peripheral surface of said annular rotary body with a predetermined spacing interposed therebetween, a plurality of through holes, each said through hole extending from a respective said housing groove to said inner peripheral surface;

(2) a drive means for intermittently rotating said annular rotary body of said chip-form electronic part loading body;

(3) a vibration supply device for consecutively placing chip-form electronic parts into respective housing grooves at the top of said chip-form electronic part loading body through said lateral openings thereof;

(4) a suction holding device comprising a first recess provided in said peripheral surface of said fixed head in an area facing said tape-like housing body, and in a position which sequentially communicates with said through hole as said annular rotatable body is rotated about said fixed head, and a vacuum source for absorbing the air in said first recess thereby enabling the electronic part housed in each said housing groove whose through hole communicates with said first recess to be suction-held in said housing groove; and

(5) a forced falling device including a second recess provided in said peripheral surface of said fixed head in an area adjacent said first recess, and in a position which sequentially communicates with each said through hole as said annular rotatable body is rotated about said fixed head, and an air pressure source for supplying air pressure into said second recess, as each said housing groove reaches a position wherein its said through hole comunicates with said second recess, the said electronic part housed in said housing groove is forced to fall by said air pressure out of said housing groove and into said housing hole of the tape-like housing body.

17. Apparatus, comprising:

(A) an intermittent feed device for intermittently feeding a tape-like housing body having a plurality of housing holes formed therein at predetermined intervals, said intermittent feed device including a rail along which said tape-like housing body travels;

(B) a loading device provided along the traveling path of said tape-like housing body and adapted to load a respective chip-form electronic part into each housing hole when that housing hole is located at a chip insertion position, said electronic part loading device comprising:

(1) a through hole provided in the rail at a location corresponding to said chip insertion position;

(2) an electronic part supplying device for supplying a chip-form electronic part to a first position adjacent and below the through hole;

(3) a push-up device adapted to push up the chip-form electronic part located at said first position through said through hole and into said chip insertion position when a housing hole of said tape-like housing body is located at said chip insertion position such that a chip-form electronic part is placed in that housing hole; and

(4) a suction holding device disposed above the through hole for suction-holding the chip-form electronic part pushed up into the housing hole located at said chip insertion position;

(C) a cover sheet supply device for supplying at least one tape-like cover sheet to a surface of the tape-like housing body so as to enclose each said housing hole after a respective chip-form electronic part has been placed therein;

(D) a cover sheet adhering device for adhering said at least one cover sheet to said housing body so as to form a strip-like container housing chip-form electronic part; and

(E) a winding device for winding the strip-like container around the reel.

18. Apparatus, comprising:

(A) an intermittent feed device for intermittently feeding a tape-like housing body having a plurality of housing holes formed therein at predetermined intervals;

(B) a loading device provided along the traveling path of the

tape-like housing body and adapted to load a respective chip-form electronic part into each of said housing holes;

(C) a cover sheet supply device for supplying at least one tape-like cover sheet to a surface of said tape-like housing body so as to enclose each said housing hole after a respective chip-form electronic part has been placed therein;

(D) a cover sheet adhering device for adhering said at least one cover sheet to said housing body so as to form a strip-like container housing chip-form electronic part; and

(E) a winding device for winding said strip-like container around a reel, said winding device comprising:

(1) a reel for taking up the strip-like container housing chip-form electronic parts transported by the intermittent feed device, said reel being rotatably provided on a first axis body;

(2) a motor connected to the first axis body for rotating the reel;

(3) a tension roll provided on one end of an arm fixed to a rotatable second axis body for pressure tightening the strip-like container transported by the intermittent feed device;

(4) a cam body mounted on the second axis body so as to be rotatable integrally with the arm of the tension roll; and

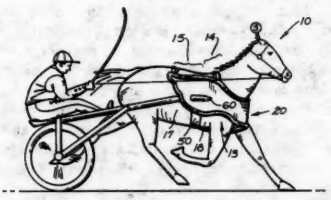
(5) a pair of switches provided in locations in which they are pressed by the cam body, the location of the tension roll pressing the strip-like container being shifted as a function of the length of the portion of the strip-like container disposed between the intermittent feed device and the reel, the switches thus pressed by the cam body being actuated thereby intermittently driving the motor for rotating the reel.

4,575,996

HORSE WIND AND MUD DEFLECTOR

Glenn R. Ferguson, Rte. 1 Box 305, Cusick, Wash. 99119, and Kenneth R. Ferguson, 1184 Foothill Rd., Box 283, Moscow, Id. 83843

Filed Jan. 11, 1985, Ser. No. 690,779
Int. Cl.⁴ B68C *5/00*
U.S. Cl. 54—80 **19 Claims**



1. A wind and mud deflector for horses, comprising:

an elongated flexible body formed of sheet material including opposed side panels joined at a front section;

said side panels and front section including longitudinal top and bottom edges spaced apart by a distance at the front section such that the front section will cover substantially the entire breast of a horse;

wherein the side panels extend longitudinally from the front section and taper to reduced rearward ends;

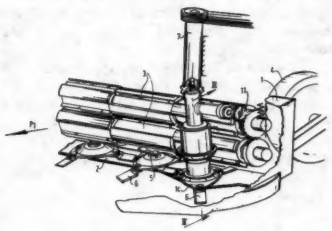
strap means on the body for attaching the body to a horse with the frontal section centered on the horse's breast, with the side panels extending rearwardly from the frontal section over the shoulders and ribs on opposite sides of the horse, and with the rearward side panel ends situated adjacent the horse's back and forward of the hips.

4,575,997

MOWING DEVICE HAVING IMPROVED DRIVE AND/OR A CROP SEPARATING DRUM

Hendrikus J. A. Van Paradijs, St. Oedenrode, and Gysbert J. Mynders, Nieuw-Vennep, both of Netherlands, assignors to Multinorm B.V., Nieuw Vennep, Netherlands

Filed Mar. 2, 1984, Ser. No. 585,543
Claims priority, application Netherlands, Mar. 4, 1983, 8300800
Int. Cl.⁴ A01D *43/10*
U.S. Cl. 56—16.4 **9 Claims**



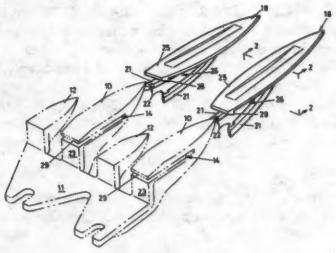
1. A mowing device comprising a frame movable across the field and a cutter bar carried by the frame and having a plurality of cutter members rotatable about standing shafts by means of a transmission arranged in said bar, said frame being adapted to accommodate rotatable crop crushing means at a higher level than the cutter bar, whilst at least one of the outermost cutting members is provided with a drum characterized in that the drum comprises two coaxially aligned parts, said aligned parts having overlapped end portions in which one of said end portions is disposed within the other of the end portions and said end portions terminating in generally parallel edges inclined with respect to the axes of said parts to protect the interior of the drum from dirt or other material, a main drive rotates said crushing means and said one cutting member through an intermediate drive disposed in said drum, said intermediate drive including length-compensating means and being formed by a shaft of non-metallic material.

4,575,998

HARVESTER COMB FINGERS

Donald G. Brooks, 12 O'Malley St., Osborne Park, Australia 6017

Filed Mar. 26, 1985, Ser. No. 716,058
Claims priority, application Australia, Mar. 26, 1984, PG4250
Int. Cl.⁴ A01D *55/12*
U.S. Cl. 56—312 **6 Claims**



1. A grain harvester comb finger extension for a knife guard finger of a cutter bar/harvester comb assembly, comprising an upper portion, a lower portion, an aperture in the lower portion the surface walls of which are complementary in

size and shape to the knife guard finger so that the finger extension can fit in a glove-like manner over the front end of the knife guard finger,

the lower portion comprising at least one rearwardly extending latching portion engageable with an abutment surface at the rear end of the knife guard finger,

said finger extension being of flexible and resilient polymeric material.

4,575,999

PNEUMATIC NOZZLE UTILIZED IN THE PROCESS OF PRODUCING A FASCIATED YARN

Meiji Anahara, Kariya, and Hiroshi Omori, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

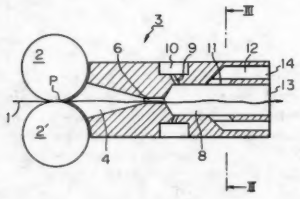
Filed Jul. 14, 1983, Ser. No. 513,412

Claims priority, application Japan, Jul. 21, 1982, 57-125853

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.⁴ D01H *5/28;* D02G *1/04*

U.S. Cl. 57—333 **6 Claims**



1. In a pneumatic nozzle utilized in the process of producing a fasciated yarn, provided with a passage for transporting a bundle of fibers in which an inlet portion, a small channel, and a large channel having an outlet opening communicating to the outside at a downstream end thereof are successively arranged from the upstream end thereof to the downstream end thereof and at least one air-supply aperture for tangentially ejecting compressed air toward a restricted region of said passage in said large channel, an improvement comprising a supplemental connecting means formed in said nozzle for connecting said large channel with the outside of said nozzle, said connecting means being formed downstream of said restricted region in said large channel where said air stream from said air-supply aperture is directed, whereby a part of the air in said large channel is capable of discharging through said connecting means while the remaining volume of air in said large channel is discharged through said outlet opening of said large channel.

4,576,000

SPINNING ROTOR FOR AN OPEN-END SPINNING DEVICE AND PROCESS OF MAKING SAME

Rolf Griesinger, Göppingen-Faurndau, and Gerhard Fetzer, Süssen, both of Fed. Rep. of Germany, assignors to Hans Stahlecker, Fed. Rep. of Germany and Fritz Stahlecker, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,931

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324128

Int. Cl.⁴ D01H *1/12*

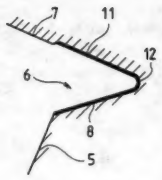
U.S. Cl. 57—416 **10 Claims**

1. Spinning rotor construction for an open-end spinning machine including a rotor made from a plastically deformable material, comprising:

a rotor bottom,

a fiber collecting groove adjoining the rotor bottom and exhibiting the maximum rotor internal diameter, said fiber collecting groove being uncoated and being made from said material,

and a sliding wall commencing at an open face side of the rotor, and extending in a conically widening manner to the fiber collecting groove,



wherein the surfaces of the fiber collecting groove are hardened by being plastically deformed.

4,576,001

GAS TURBINE ENGINE OIL SYSTEMS

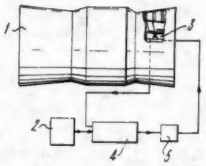
Stanley Smith, Gloucestershire, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 24, 1984, Ser. No. 573,312

Claims priority, application United Kingdom, Feb. 11, 1983, 8303903

Int. Cl.⁴ F02C *7/06;* F02G *3/00*

U.S. Cl. 60—39.08 **8 Claims**



1. A gas turbine engine oil system comprising an oil storage tank, a rotatable centrifugal separator, bearing chambers of an engine, scavenge means which operatively removes oil from the bearing chambers and directs it to the centrifugal separator, means for pressurizing said tank to a first pressure, conduit means which operatively conveys oil from the interior of said tank to the centrifugal separator oil circulating means which operatively directs at least a portion of the oil from the separator to the engine bearing chambers by centrifugal action of the centrifugal separator without passing the oil through said tank, and where said conduit means also operatively directs oil in excess of that required by the oil circulating means, back to said tank, at a pressure higher than the first pressure, whereby the bearing chambers and the tank are in separate flow circuits with each said circuit having said separator as an element thereof.

4,576,002

EXHAUST MIXER FOR TURBOFAN AEROENGINE

George Mavrocostas, Lanarca, Cyprus, assignor to Rolls-Royce Limited, London, England

Filed Aug. 22, 1984, Ser. No. 643,183

Claims priority, application United Kingdom, Sep. 14, 1983, 8324669

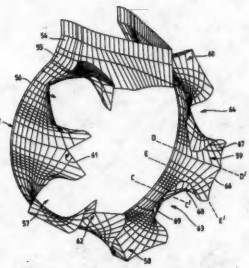
Int. Cl.⁴ F02K *3/02*

U.S. Cl. 60—262 **8 Claims**

1. An exhaust mixer of the multi-lobed type for a bypass gas turbine aeroengine whereby during operation of said aeroengine there is established a vortex system downstream of said exhaust mixer to encourage mixing between a bypass airstream and a turbine exhaust stream, said mixer comprising:

a plurality of troughs and lobes, said troughs being located

between said lobes, said troughs and said lobes comprising confronting pairs of flow surfaces, said flow surfaces having a progressive twist between their upstream and downstream ends such that said vortex system is established, said vortex system including vortices of said bypass air and said turbine exhaust trailing from said downstream ends of said flow surfaces, and vortex destabilising means including said twisted flow surfaces having downstream edges in the form of sinuous curves each having a single



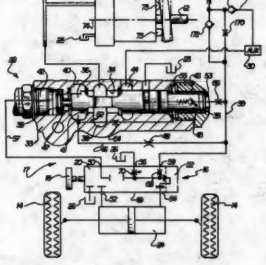
point of inflection, said sinuous curves producing substantial variations in the degree of twist of the downstream ends of the flow surfaces relative to their upstream ends, said bypass airstream and said turbine exhaust stream leaving the downstream edges of said flow surfaces with a substantial range of rotational velocity components and a substantial range of velocity components transverse to the streamwise direction of air and exhaust flow whereby said vortex system is rendered unstable and said vortices interact with one another to burst.

4,576,003

HYBRID LOAD-SENSE VEHICLE HYDROSTATIC STEERING SYSTEM

Jim L. Rau, Lafayette, and Ronald L. LaHue, West Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 437,633, Oct. 29, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 713,085
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—384 **11 Claims**



1. A hydrostatic steering system for operating a vehicle steering motor comprising

a source of fluid,

a hydrostatic steering controller having an inlet port, a load sense port, a metering unit, and a control valve,

a main fluid circuit communicating fluid from said source to the inlet port of the controller,

a pilot fluid circuit for directing pilot fluid from said source to the load sense port of the controller, and

means responsive to fluid pressure in the pilot fluid circuit for controlling fluid flow in the main fluid circuit to the inlet port of the controller,

said control valve having a neutral position and being movable away from said neutral position in accordance with an operator's demand and a steering load for directing and controlling fluid flow from the inlet port and the load sense port to the metering unit and from the metering unit to the steering motor, the control valve directing pilot fluid from the load sense port to a reservoir when the control valve is in its neutral position and communicating pilot fluid from the load sense port to the metering unit as the control valve moves away from its neutral position,

said metering unit being operable at a rate which corresponds to the operator's demand and the steering load when the rate of fluid being directed to the metering unit equals the rate at which metered fluid is being directed to the steering motor, the pilot fluid circuit directing sufficient pilot fluid to the load sense port for the metering unit to operate at a rate which corresponds to the operator's demand and the steering load over a range of operator demands and steering loads, said control valve, when in said neutral position, blocking fluid at said inlet port of said hydrostatic steering controller, said control valve being biased to said neutral position and, in response to rotation of the vehicle's steering wheel, being movable away from said neutral position and to an operating condition in which it establishes a main flow control orifice communicating said inlet port with said metering unit, said control valve as it moves away from said neutral position restricting the flow of pilot fluid to the reservoir and communicating pilot fluid to the metering unit at a rate such that the pilot fluid directed to the metering unit is sufficient for the metering unit to operate at a rate which corresponds to the operator's demand and the steering load over said range of operator demands and steering loads,

said source including a variable displacement pump having an outlet,

said pilot fluid circuit including a main pilot conduit communicating with the load sense port of the controller, and first and second branch pilot conduits, and

said means responsive to fluid pressure in the pilot fluid circuit including actuator means for controlling the displacement of the pump, a flow compensator valve for effecting operation of the actuator means, and a priority valve which communicates fluid from the pump to the inlet port of the controller,

said priority valve including an inlet communicating with the source, a priority outlet communicating with the inlet port of the hydrostatic steering controller, an auxiliary outlet, a pilot outlet connected to the main pilot conduit, a priority valve element for controlling a flow of fluid communicated to the inlet port of the controller, first biasing means biasing the priority valve element to a priority position in which it communicates the inlet with the priority outlet and blocks communication between the inlet and the auxiliary outlet, and means defining a pilot fluid pressure cavity at one end of the valve element so that fluid in said cavity produces a fluid pressure force acting on the valve element, the priority outlet of the priority valve being communicated with the other end of the priority valve element,

the priority valve element being movable away from its priority position when fluid pressure force on said other end of the priority valve element exceeds the force of the first biasing means and the fluid pressure force on said one end of the valve element, the priority valve element as it

moves away from its priority position (i) gradually restricting communication between the inlet and the priority outlet and (ii) establishing and gradually increasing communication between the inlet and the auxiliary outlet,

said first branch pilot conduit branching from the priority outlet of the priority valve and directing pilot fluid through the pilot fluid pressure cavity to the pilot outlet, the first branch pilot conduit including a first orifice located between the priority outlet and the pilot fluid pressure cavity and a second orifice located between the pilot fluid pressure cavity and the pilot outlet,

said second branch pilot conduit branching from the priority outlet of the priority valve in parallel with the first branch pilot conduit and directing additional pilot fluid from the priority outlet to the main pilot conduit,

said actuator means including second biasing means urging the actuator means to a maximum displacement position and fluid actuated means for opposing the second biasing means,

said flow compensator valve including a flow compensator valve element, third biasing means for biasing the flow compensator valve element to a first position in which the displacement of the pump is at a maximum value, and means defining pressure cavities at opposite ends of the flow compensator valve element,

the outlet of the pump communicating with the pressure cavity at one end of the flow compensator valve element and fluid pressure in the main pilot circuit being communicated to the pressure cavity at the other end of the flow compensator valve element, said flow compensator valve element being movable away from its first position when a net fluid pressure force on the element exceeds the force of said third biasing means,

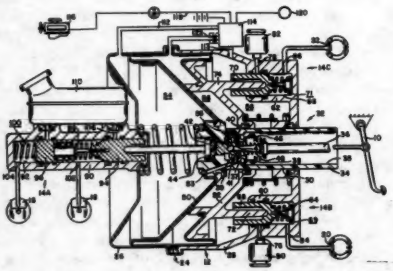
said flow compensator valve element when moved away from its first position communicating fluid from the fluid pressure cavity at said one end of said flow compensator valve element to the fluid actuated means which opposes the second biasing means, thereby to reduce the displacement of the pump.

4,576,004

BRAKING DEVICE WITH OPPOSITELY MOVABLE DIAPHRAGMS

Lloyd G. Bach, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jul. 2, 1984, Ser. No. 627,012
Int. Cl.[4] B60T *13/00*
U.S. Cl. 60—547.1 **8 Claims**



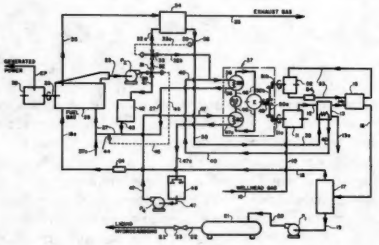
1. A brake system comprising a vacuum brake booster and master cylinder assembly, in combination, wherein the booster generates a power assist to actuate the master cylinder and communicate fluid pressure to a plurality of vehicle brake assemblies, the booster defining a housing with a pair of movable diaphragms therein; the diaphragms cooperating with the housing to substantially define three pressure cavities, and a valve assembly operable during braking to create a fluid pressure differential across the pair of diaphragms which biases the latter to move in opposite directions, and the housing includes a front shell adjacent a first master cylinder with one of the pair of diaphragms operatively coupled to the first master cylinder via suitable means so that movement of the one diaphragm generates fluid pressure in the first master cylinder for communication with one of the brake assemblies, characterized in that the housing includes a rear shell supporting a second master cylinder remote from the first master cylinder and the other diaphragm is operatively coupled to the second master cylinder to generate fluid pressure in the second master cylinder in response to movement of the other diaphragm.

4,576,005

WELLHEAD GAS TREATMENT AND CO-GENERATION METHOD AND SYSTEM

Louis W. Force, 718 North Dr., New Buffalo, Mich. 49117

Filed Jan. 7, 1985, Ser. No. 689,151
Int. Cl.[4] F01K *23/06*
U.S. Cl. 60—618 **14 Claims**



1. In the method of treating raw wellhead gas to recover liquefiable hydrocarbons therefrom and of utilizing the remaining non-condensible hydrocarbon gas as fuel in an internal combustion engine - generator system to produce electric power, the steps comprising:

(a) compressing raw wellhead gas to a pressure and cooling said compressed wellhead gas to a temperature sufficient to condense the ethane and higher molecular weight hydrocarbon components of said wellhead gas;

(b) separating the condensed components of said wellhead gas from the non-condensible methane and lower molecular weight components thereof in a pressure chamber and removing said condensed components of said wellhead gas from said chamber as a bottoms stream of liquefied hydrocarbon product;

(c) removing the non-condensible methane and lower molecular weight components of said wellhead gas from said pressure chamber as a combustible gaseous stream and utilizing said gaseous stream as fuel in the engine of an internal combustion engine - generator system to produce electric power;

(d) introducing water coolant to the cooling section of the engine of said engine - generator system to cool said engine with the attendant heating of said coolant;

(e) removing the heated water coolant from the cooling section of said engine and utilizing said heated coolant as a waste heat source for heating the circulating fluid medium in a closed circuit organic Rankine cycle engine to produce work energy; and

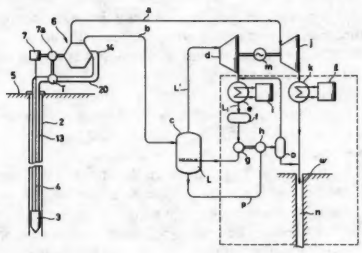
(f) utilizing a first portion of the work energy produced by said Rankine cycle engine to compress said wellhead gas and a second portion of the work energy produced by said Rankine cycle engine to cool said compressed wellhead gas to condense the ethane and higher molecular weight hydrocarbon components of said wellhead gas.

4,576,006

GEOTHERMAL HOT WATER TRANSPORTATION AND UTILIZATION SYSTEM

Keijiro Yamaoka, Tokyo, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,223
Int. Cl.[4] F03G 7/04
U.S. Cl. 60—641.5 5 Claims



1. A geothermal hot water transportation system for transporting geothermal hot water from underground to above ground, comprising

means for pressurizing and pumping hot water from a geothermal production well to a location above ground including a downhole pump for installation in the geothermal production well, and a long downhole pump shaft;

a pump casing having a below surface end connected to said down hole pump and an above surface end;

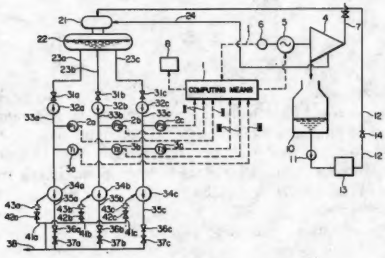
means for separating steam and hot water brought to the surface from the well by said downhole pump through said pump casing, including an above ground rotary separation two-phase flow turbine communicating with said above surface end of said pump casing, said two-phase flow turbine having a power output shaft means for directly powering said downhole pump through said downhole pump shaft.

4,576,007

METHOD AND APPARATUS FOR CONTROLLING AN OPERATION OF PLANT

Tadao Arakawa; Takeshi Ueno; Hiroshi Tsunematsu; Keiichi Toyoda, and Tsuguo Hashimoto, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,150
Claims priority, application Japan, Mar. 26, 1984, 59-55991
Int. Cl.[4] F01K 13/02
U.S. Cl. 60—660 18 Claims



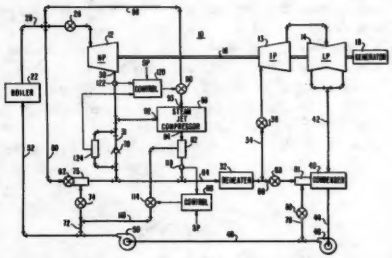
1. A method of controlling an operation of a turbine plant on a reduction of the load on a turbine, said turbine plant including a condenser for condensating the steam extracted from said turbine, a deaerator for deaerating a condensate from said condenser, feedwater pumps for supplying the deaerated feedwater to a boiler which evaporates the feedwater and supplies the steam to said turbine, and downcomer pipes through which said feedwater pumps are connected to said deaerator, said method comprising: measuring a load on said turbine and a pressure and a temperature of the feedwater in said downcomer pipes; computing an operational turbine load by means of computing means in accordance with the measured values, a demand load and a time duration in which the load has to be reduced; and controlling the load on said turbine while maintaining the pressure in said downcomer pipes higher than the saturation pressure corresponding to the temperature in said downcomer pipes.

4,576,008

TURBINE PROTECTION SYSTEM FOR BYPASS OPERATION

George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 11, 1984, Ser. No. 569,866
Int. Cl.[4] F01K 13/02
U.S. Cl. 60—662 6 Claims



1. In a steam turbine installation having a high pressure turbine, a steam generator for providing steam to said turbine, at least a lower pressure turbine, a reheater in the steam path between said high and lower pressure turbines, and a steam bypass path for bypassing said turbines, said high pressure turbine having a one-way check valve in its output steam line to prevent bypass steam from entering its output, the improvement comprising:

(A) a second bypass path for passing steam around said high pressure turbine;

(B) said second bypass path including,

(i) steam jet compressor means including two input sections and an output section, with one said input section being connected to said high pressure turbine output, the other said input section being connected to receive steam from said steam generator and said output section being connected to the input of said reheater,

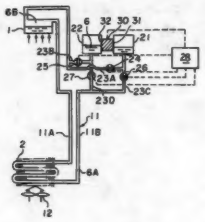
(ii) valving means for controlling the steam supply from said steam generator to said steam jet compressor means; and

(C) control means responsive to an output condition at said high pressure turbine output for controlling said valving means.

4,576,009
HEAT TRANSMISSION DEVICE

Tetsurou Ogushi, Kawanishi, and Masaaki Murakami, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,151
Claims priority, application Japan, Jan. 31, 1984, 59-15887; Jan. 31, 1984, 59-15888; Feb. 15, 1984, 59-26473
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **15 Claims**

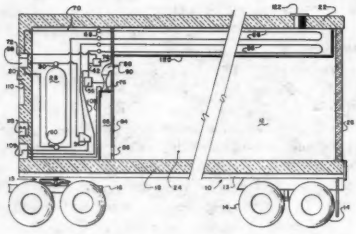


1. A heat transmission device comprising:
(a) a heat receiving part;
(b) a heat radiating part;
(c) a looped pipeline connecting said heat receiving part and said heat radiating part, said looped pipeline containing, during use, a working fluid having condensing properties as a heat transferring medium;
(d) a plurality of accumulators interposed in a parallel arrangement in said pipeline upstream of said heat receiving part but downstream of said heat radiating part;
(e) a heating/cooling means for heating and cooling said accumulators;
(f) a control means which performs alternately the first, operation of feeding said working fluid condensed at said heat radiating part to a first one of said accumulators and the second operation of circulating said working fluid in said first one of said accumulators to said heat receiving part and performs alternately said first and second operations in the reverse order in a second one of said accumulators.

4,576,010
CRYOGENIC REFRIGERATION CONTROL SYSTEM

Robert J. Windecker, Palm Beach, Fla., assignor to Nhy-Temp, Inc., West Palm Beach, Fla.

Filed Oct. 18, 1983, Ser. No. 543,059
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **9 Claims**

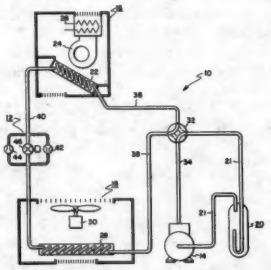


1. A process involving a refrigeration container having
a. an insulated compartment having a compartment temperature,
b. at least one cryogenic tank in the compartment,
c. cryogenic fluid coolant in the liquid and vapor states in the cryogenic tank,
d. a vapor conduit fluidly connected to the coolant vapor in the tank,
e. a liquid conduit fluidly connected to the coolant liquid in the tank;
wherein the improved method of refrigerating the container comprises the following steps in combination with the above:
f. selecting a minimum temperature such that when the compartment temperature is below the minimum temperature, no cooling of the compartment is desired,
g. selecting a maximum temperature that is higher than the minimum temperature, then
h. sensing the compartment temperature,
i. comparing the compartment temperature with the minimum and maximum temperatures, and then
j. venting excess coolant vapor from the vapor conduit to outside the compartment when the compartment temperature is below the minimum temperature, and
k. flowing coolant vapor from the vapor conduit into the compartment when the compartment temperature is above the minimum temperature and below the maximum temperature, and
l. vaporizing the coolant liquid in a vaporization section of the liquid conduit, and
m. releasing the vaporized coolant liquid into the compartment when the compartment temperature is above the maximum temperature.

4,576,011
AIR CONDITIONING SYSTEM AND METHOD OF OPERATION

Paul R. Glamm, and James C. Wendschlag, both of La Crosse, Wis., assignors to Electric Power Research Institute, Palo Alto, Calif.

Continuation of Ser. No. 437,903, Nov. 1, 1982, abandoned. This application Aug. 16, 1984, Ser. No. 641,413
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—115 **12 Claims**

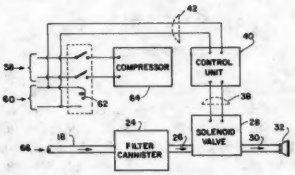


1. A method for rapidly achieving steady state operation in a desired operating mode of an air conditioning device having a compressor, a heat exchanger which operates as a condenser in the mode and a heat exchanger which operates as an evaporator in the mode, said method comprising the sequential steps at start up of:
a. providing a substantially unrestricted path for the flow of refrigerant from said evaporator to said condenser;
b. flooding refrigerant from said evaporator to said condenser through the unrestricted path; and
c. providing a restricted path for metering refrigerant flow from said condenser to said evaporator during the desired operating mode.

4,576,012
EVAPORATIVE COOLER

Robert S. Luzenberg, Tierra Verde, Fla., assignor to Computer Air Corp., Pompano Beach, Fla.

Filed Mar. 26, 1984, Ser. No. 593,706
Int. Cl.[4] G05D *23/32*
U.S. Cl. 62—157 3 Claims



1. An apparatus for applying water in the form of a cooling water spray to the heat exchanger of an air conditioning condenser unit, comprising in combination:

a solenoid valve for controlling the flow of the water;

a spray nozzle positioned so as to direct the cooling water spray onto the heat exchanger;

a first water line to conduct water to said solenoid valve;

a second water line to conduct water from said solenoid valve to said spray nozzle;

a control unit for controlling said solenoid valve;

a water filter interposed in said first water line for filtering the water supplied to said solenoid valve, wherein said water filter includes a filter element which is replaceable;

wherein said solenoid valve contains bias means for urging said solenoid valve into the closed position and for preventing the flow of water through said solenoid valve except when said solenoid valve is actuated by said control unit and wherein said control unit actuates said solenoid valve only when the heat exchanger is in operation;

wherein said control unit is an oscillator the period of which is selectable;

wherein the duration of the "OFF" portion of said period of said oscillator is selectable and the "ON" portion of said period of said oscillator is also selectable with the durations of the "OFF" and "ON" portions of the control unit being in the range from 2 seconds to 1 minute; and

a sacrificial anode in contact with the heat exchanger.

4,576,013
EVAPORATIVE COOLING

Charles J. Sperr; Douglas C. Sperr, both of 8432 E. Wilshire Dr., Scottsdale, Ariz. 85257, and Thad J. Genrich, Mesa, all of Ariz., assignors to Charles J. Sperr and Douglas C. Sperr, both of Phoenix, Ariz.

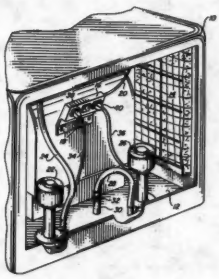
Filed Mar. 22, 1984, Ser. No. 592,464
Int. Cl.[4] F28D *3/00*
U.S. Cl. 62—171 14 Claims

1. An improved evaporative cooler of the type which includes a housing, at least one air pervious liquid absorbing pad spanning an opening in said housing through which a stream of air is drawn to cool the air, and a sump pan at a lower portion of said housing for serving as a reservoir of cooling liquid, said improved evaporative cooler comprising:

a drain pipe;

pump means for supplying liquid to said at least one evaporative pad and for draining liquid through said drain pipe; and

control means coupled to said pump means for causing said pump means to supply liquid to said at least one evaporative pad for a first predetermined period of time out of each successive second predetermined period of time and for causing said pump means to drain said liquid through said drain pipe for a third predetermined period of time

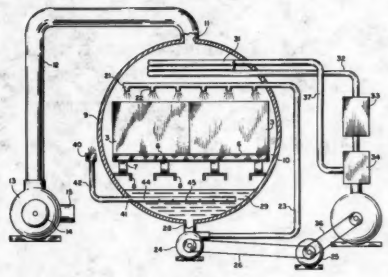


following the first occurence of said first predetermined period of time after said evaporative cooler is turned on.

4,576,014
PRODUCE VACUUM COOLER WITH IMPROVED VENTING

Craig A. Miller, and Floyd E. Miller, both of Fremont, Calif., assignors to Western Precooling Systems, Inc., Fremont, Calif.

Filed Jan. 31, 1985, Ser. No. 697,050
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—268 5 Claims



1. A produce cooler comprising:

a vacuum chamber,

means in said chamber for supporting produce therein,

means for pumping out said chamber to provide at least a partial vacuum therein,

means in said chamber for discharging water into said chamber at a location above said produce to allow said water to flow downward over said produce,

means for cooling and condensing water vapor in said chamber at a location above said produce to cause cool condensed water to flow downward over said produce,

a sump in the bottom of said chamber for collecting and holding water,

a pipe extending into said vacuum chamber from the outside to vent the outside air into said chamber through an inner end to relieve the vacuum therein so the chamber can be opened and the cooled produce removed,

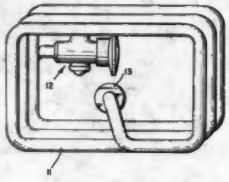
said pipe including means to regulate the flow of incoming air into said vacuum chamber to slow the rate of increase of air pressure in said vacuum chamber.

4,576,015

LIGHTWEIGHT HIGH PRESSURE TUBULAR STORAGE SYSTEM FOR COMPRESSED GAS AND METHOD FOR CRYOGENIC PRESSURIZATION

A. Gerrit Crawford, 6223 Bakman St., North Hollywood, Calif. 91606

Filed Apr. 14, 1983, Ser. No. 484,878
Int. Cl.[4] F25B 45/00
U.S. Cl. 62—292 4 Claims



1. A lightweight high pressure tubular storage system for storing and transporting a gas comprising:

a. a thin-walled tubular member of uniform diameter throughout being formed from a metallic or composite material and having an open first end and an open second end to which fittings, valves, coupling and/or closure can be affixed;

b. inletting means for bringing a cryogenic fluid into said tubular member wherein said inletting means is fluidly coupled to said first end; and

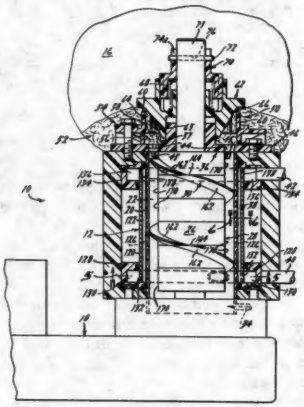
c. outletting means for regulating the flow of a compressed gas from said tubular member wherein said outletting means is fluidly coupled to said second end whereby the cyrogenic fluid is allowed to warm up within said tubular member and change into the compressed gas.

4,576,016

ICE MAKING APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King Seeley Thermos Co., Prospect Heights, Ill.

Filed Jan. 13, 1984, Ser. No. 570,610
Int. Cl.[4] F25C 5/14, 1/14
U.S. Cl. 62—320 49 Claims



34. An ice-making apparatus comprising:

a refrigeration system including a combination evaporator and ice-forming assembly adapted to receive ice make-up water communicated thereto and to produce relatively wet and loosely associated ice particles from said ice make-up water, said combination evaporator and ice-forming assembly further including an inner housing defining a substantially cylindrical freezing chamber, refrigeration means adjacent said freezing chamber, an axially-extending auger rotatably mounted in said freezing chamber, and an outlet through which said wet and loosely associated ice particles are forcibly urged by said combination evaporator and ice-forming assembly;

a first interchangeable head assembly removably connectable to said combination evaporator and ice-forming assembly, said first head assembly including compression means in communication with said outlet for forcibly compressing quantities of said wet and loosely associated ice particles in order to remove a substantial portion of the unfrozen water therefrom and form relatively dry and loosely associated flaked ice particles, said compression means including means for discharging said flaked ice particles from said first head assembly; and

a second interchangeable head assembly preselectively interchangeable with said first head assembly and being removably connectable to said combination evaporator and ice-forming assembly, said second head assembly including compacting means in communication with said outlet means for forcibly compressing quantities of said wet and loosely associated ice particles in order to remove a substantial portion of the unfrozen water therefrom and to compact said wet and loosely associated ice particles into substantially monolithic relatively hard compacted ice, means for discharging said compacted ice from said second head assembly in a substantially continuous elongated ice form having a predetermined cross-section, and ice breaker means for breaking said elongated compacted ice form into discrete compacted ice pieces of a predetermined length and having substantially the same cross-section as said discharged elongated compacted ice form, said ice making apparatus thereby being preselectively adaptable to produce either relatively dry loosely associated flaked ice particles or discrete compacted ice pieces by selectively connecting either said first or second head assembly to said combination evaporator and ice-forming assembly;

said axially-extending auger including a central body portion, at least one flight portion extending in a generally spiral path along at least a substantial part of the periphery of said central body portion with an outer edge of said flight portion being adapted to be disposed closely adjacent the inner surface of said housing in order to scrape ice particles therefrom as said auger is rotated, said flight portion being defined by a plurality of discontinuous flight segments disposed generally end-to-end adjacent one another along said generally spiral path, adjacent pairs of said discontinuous flight segments being spirally misaligned relative to one another in order to form spiral non-uniformities therebetween, said spiral misalignment of said adjacent discontinuous flight segments tending to break up the mass of ice particles scraped from the inner surface of the housing as said auger is rotated, said auger further comprising a rotatable shaft member, a plurality of discrete disc elements axially stacked on said shaft member and secured for rotation therewith, the axial length of each of said disc elements being substantially less than the axial length of said auger, said discrete disc elements defining said central body portion and said flight portion; and

said refrigeration means including an outer jacket member substantially surrounding the outer surface of said inner housing and disposed in a radially spaced relationship therewith to define a generally annular refrigerant chamber therebetween, said refrigerant chamber being closed at opposite ends thereof, a refrigerant inlet for communicating a flowable refrigerant material therethrough into said refrigerant chamber, a refrigerant outlet for discharging the refrigerant material therethrough from said refrigerant chamber, the outer surface of said inner housing

having a plurality of fin-like members thereon, said fin-like members protruding into said refrigerant chamber and being circumferentially-spaced relative to one another around substantially the entire outer surface of said inner housing, said fin-like members being adapted to enhance the turbulent flow of said refrigerant material through said refrigerant chamber and to substantially maximize the heat transfer surface area of said outer surface of said inner housing.

4,576,017

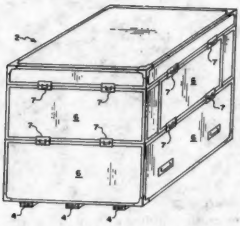
INSULATED SHIPPING CONTAINER

Cathy M. Combs, Antioch; Joseph K. Duffy, Lake Forest, and Mark Thoene, Ingleside, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 26, 1985, Ser. No. 705,584

Int. Cl.[4] F25D *3/08*

U.S. Cl. 62—372 **11 Claims**



1. A container for maintaining its contents at a desired temperature for an extended period of time, comprising:

an outer shell which is substantially airtight and which has side walls and inner surfaces;

a passive heat exchange medium;

a support structure for the heat exchange medium; and

means for maintaining a space between the contents of the container and substantially the entire inner surface of the sides and bottom of the outer shell of the container and between the contents of the container and the support structure for the heat exchange medium for allowing convection in said space to maintain a substantially uniform temperature throughout the contents of the conter;

said spacer means comprising blocks, each block having a side which faces said side wall of said container and a side which faces said contents, each of said sides of said blocks having a surface area which is less than 70% of the surface area of the adjacent side wall of said container.

4,576,018

STITCH-FORMING MACHINE

Alfred Schindele, Filderstadt, Fed. Rep. of Germany, assignor to Terrot Strickmaschinen GmbH, Stuttgart, Fed. Rep. of Germany

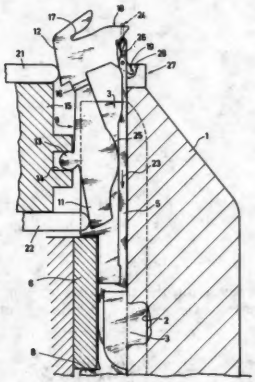
Filed May 25, 1984, Ser. No. 613,957

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320043

Int. Cl.[4] D04B *15/06*

U.S. Cl. 66—106 **2 Claims**

1. A stitch-forming machine comprising needles (5) having needle shafts and needle heads (26), needle support means (1) for guiding said needles for longitudinal inward and outward displacement, needle cams (6,7) for controlling said needles, sinkers having sinker throats (17) and knitting surfaces (18), sinker support means (15) separate from said needle support means for guiding said sinkers, sinker cams (21, 22) for controlling said sinkers, said sinkers having shaft portions and head portions and protruding swivel butts, said sinker support means having a plane cam guideway (14) for receiving said protruding swivel butts to mount said sinkers for pivotal movement while restraining said sinkers against movement in the longitudinal direction, the geometrical relation of the swivel butts (13) on the sinkers with relation to the knitting surfaces (18) being such that by pivoting the sinkers the knitting surfaces thereof are raised through a predetermined distance with reference to a given point on the edge of the needle support means (1) in the region of the knitting heads to move the knitting surfaces (18) in a direction opposite to the inward displacement of the needles, said needle support means having



slits (4), one sinker (9) being arranged behind one needle (5) in each of said slits as viewed from said needle support means in the direction of said sinker support means, said sinkers (9) having crank-like bendings (16) between their shafts (11) and heads (12) to allow the sinker heads (12) to penetrate between two adjacent needle heads (26), said sinker shafts (11) having curved portions (25) on their edges opposite to the swivel butts (13), said curved portions facing said needle shafts and resting slideably thereon only in a narrow line-like area.

4,576,019

CIRCULAR KNITTING MACHINE HAVING IMPROVED TAKE-DOWN APPARATUS

Frederick Keel; Keith G. Townsend, and Marshall C. Carter, all of Leicester, United Kingdom, assignors to Bentley Engineering Company Limited, Leicester, England

Filed Aug. 13, 1984, Ser. No. 639,795

Claims priority, application United Kingdom, Aug. 27, 1983, 8323128

Int. Cl.[4] D04B *15/92*

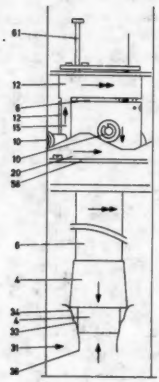
U.S. Cl. 66—147 **10 Claims**

1. In a circular knitting machine having at least a first revolving knitting cylinder, knitting cam means being located peripherally of the cylinder, an improved take-down mechanism comprising:

a take-down throat located inside of the cylinder;

a pair of take-down members, each of said take-down members having an annular resilient cup arranged concentrically with respect to said take-down throat;

take-down cam means for reciprocating said resilient cups toward and away from said take-down throat; and



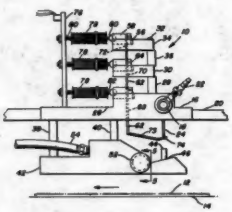
means for revolving the take-down cam means at a speed different from that of the first knitting cylinder.

4,576,020

JET PRINTER

Lamar Thurman; Billy J. Otting, and David L. Otting, all of LaFayette, Ga., assignors to Otting International, Inc., LaFayette, Ga.

Filed Jan. 22, 1985, Ser. No. 693,457
Int. Cl.[4] D06B *1/02, 11/00*
U.S. Cl. 68—205 R **29 Claims**



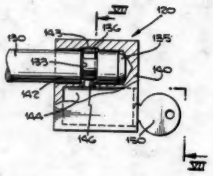
1. Apparatus for printing a moving web of sheet material by the selective application of a plurality of spaced streams of liquid dye onto the web, said apparatus comprising a bank of dye supply members spaced above the web, means for supplying dye to said members, a dye discharge member corresponding to each dye supply member, support means for supporting said discharge members intermediate said supply members and said web in flow communication with a corresponding supply member for receiving dye therefrom and discharging same onto said web, deflector support means disposed above said web, a plurality of deflecting members having a deflecting finger and a mounting portion, said deflector support means including means for constraining said mounting portions for pivotable movement about a pivot axis, each of said deflecting fingers being disposed for movement into and out of a disposition deflecting flow communication between a corresponding dye supply member and dye discharge member, a pivot block corresponding to each deflecting member carried by said deflector support means, each of said mounting portions being fastened to a corresponding pivot block so that the pivot block may pivot about said axis, a signal responsive member carried by each pivot block, signal generating means spaced from a respective signal responsive member for generating a control signal in accordance with a preselected pattern for selectively moving the respective signal responsive member about said pivot axis, whereby said pivot block and deflecting finger pivot about said axis to move the deflecting finger into and out of deflecting relationship with the stream of dye exiting the corresponding supply member to deflect the dye stream out of flow communication with the corresponding discharge member selectively, and means for catching and removing the dye deflected by the fingers.

4,576,021

TRAILER LOCK

Kenneth M. Holden, Zephyr Cove, Nev., assignor to 501 W B Lock Company, Stateline, Nev.

Filed Apr. 11, 1983, Ser. No. 483,824
Int. Cl.[4] E05B *67/36*
U.S. Cl. 70—34 **3 Claims**



1. A lock comprising:

an elongate member having a movement limiting means on one end for limiting the axial movement of the member in one direction and an inserting means on the second end for being slidably inserted into a lock housing; and

a lock housing having a means for lockingly receiving the inserting means on the second end of the elongate member, and a means for limiting the axial movement of the elongate member in the other direction;

wherein said receiving means comprises:

an elongate opening adapted to receive the inserting means of the elongate member;

means for locking the elongate member in the elongate opening, said locking means including:

a first annular recess in the inserting means;

an annular ring loosely retained within said first annular recess;

a second recess disposed in the elongate opening so as to be adjacent the annular ring when the elongate member is inserted; and

movable means associated with the lock housing for extending into the first annular recess and moving the annular ring into the second recess to lock the elongate member in the elongate opening and for withdrawing from said first recess to allow the elongate member to be withdrawn from the elongate opening.

4,576,022

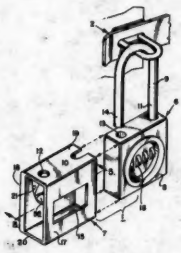
OBJECT SECURING SLEEVE FOR PADLOCK DEVICES

William E. Gamble, P.O. Box 220598, Charlotte, N.C. 28222

Filed Aug. 29, 1984, Ser. No. 645,179
Int. Cl.[4] E05B *67/53*
U.S. Cl. 70—55 **8 Claims**

1. An object-securing sleeve means for use with a host padlock of the type having a shank member and a body portion, said sleeve means comprising front, rear, top and bottom walls and being open at least at one end and so sized as to permit sliding thereof into close-fitting covering relation to said padlock body portion when said padlock is open, said sleeve means containing object-retaining means accessible from within said sleeve means when said sleeve means is free of said body portion for releasably holding within it an object to be held secure when said sleeve means is on said body portion and

said padlock is closed, said sleeve means also having locking aperture means in said top wall for permitting passage therethrough of said shank member to permit locking of said padlock and simultaneous locking of said sleeve means to said body portion, said sleeve means being so configured that when



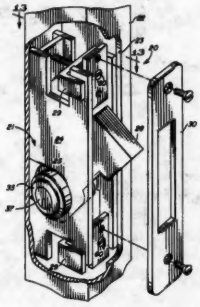
in locked position on said body portion said object cannot be removed from said object-retaining means, and wherein said sleeve means comprises window means for permitting sufficient access to said body portion to permit unlocking it while said sleeve means is in place.

4,576,023

DOOR STILE LOCK AND LATCH BOLT ASSEMBLY

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz.

Filed Sep. 16, 1983, Ser. No. 532,918
Int. Cl.[4] E05B *65/06, 9/08*
U.S. Cl. 70—137 19 Claims



1. In a lock for mounting in a hollow door-stile, said lock having a lock body engagedly supporting a cylinder and keyway block housing, said housing in turn engaging a latch bar for rotation about said housing, and further including a first lock cylinder and keyway block assembly within said housing; the improvement comprising:

a compression loaded anvil slidingly disposed within said latch bar said anvil being slidingly directed by compression loading toward the axis of said cylinder and keyway block housing when said latch bar is rotatingly engaged about said housing; and

retention means formed in the surface of said housing for lockingly engaging said anvil so as to prevent rotation of said latch bar about said housing while said anvil is so lockingly engaged.

17. A door lock comprising:

a lock cylinder housing;

an assembly comprising a lock cylinder and a keyway block within said housing;

a latch bar actuator within said housing coupled for rotation with said keyway block about the axis of said housing when a key is inserted into said keyway;

a latch bar rotatingly coupled to said housing and further drivingly coupled to said latch bar actuator for rotation about said housing when said actuator is so rotated;

a compression loaded anvil housed within said latch bar and compressively driven toward the axis of said housing;

retention means on said housing for lockingly engaging said anvil to prevent rotation of said latch bar about said housing; and

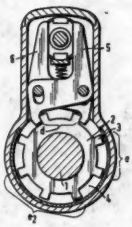
an anvil actuator coupled to said latch bar actuator for raising said anvil from engagement with said retention means to permit said latch bar to be driven about said housing by said latch bar actuator when a key is inserted in said keyway.

4,576,024

DEVICE FOR BLOCKING THE ROTARY MOVEMENT OF A STEERING COLUMN IN A MOTOR VEHICLE

Günter Weber, Wuppertal, Fed. Rep. of Germany, assignor to Neimann S.A., Courbevoie, France

PCT No. PCT/EP83/00098, § 371 Date Dec. 2, 1983, § 102(e) Date Dec. 2, 1983, PCT Pub. No. WO83/03580, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 2, 1983, Ser. No. 563,398
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213719
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—252 20 Claims



1. Device for blocking the rotary movement of a steering column (1) in a motor vehicle comprising:

a steering column (1);

a blocking bolt (5) which is actuated by a lock and in the blocking position engages in a recess (4) in the steering column;

at least one further blocking bolt (6) which can be actuated by the same lock and, like the first blocking bolt (5), in the blocking position engages in recesses (4) arranged at regular spacings around the periphery of the steering column;

protrusions (3) formed from material located between the recesses (4) having side faces (Z) for blocking the blocking bolts (5, 6); and

wherein the blocking bolts (5, 6) are arranged on only one side of the steering column (1) within no more than a 90° angle sector of the steering column.

4,576,025

MAGNETIC LOCK INSERT FOR LOCK MECHANISMS

Tibor Kassza; Gyula Kákonyi, both of Budapest, and Gábor Molnár, Sátoraljaujhely, all of Hungary, assignors to ELZETT Muvek, Budapest, Hungary

Filed Dec. 19, 1983, Ser. No. 562,713
Claims priority, application Hungary, Jul. 6, 1983, 2427/83
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—276 7 Claims

1. A magnetic-type cylinder lock mechanism comprising an internal cylinder rotatable between a locking and an opening

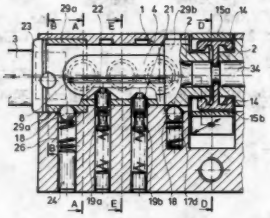
position by means of a key that includes magnetic bodies, said cylinder being provided at only one side, or at both sides of an opening such as a door, the cylinder being accommodated in a housing and formed with a keyhole;

said housing containing a plurality of tumblers of varying length radially displaceable into said keyhole, each tumbler having a housing part and a cylinder part slidable between a locked and an open position respectively preventing and permitting rotation of said cylinder;

latch grooves formed on mutually opposite sides of said cylinder; latch elements in said grooves rotatable with the said cylinder; magnetic rotor elements disposed in notches formed in said cylinder and journalled for rotation about their own axes;

latch channels formed in the magnetic rotor elements and disposed along a chord for receiving said latch elements which in their latched or wedged position constitute a means for preventing angular displacement of the cylinder by means of a foreign object;

an orienting element for determining rotatability of the lock and the removal position of the proper key;



and two control rings arranged between the cylinder and the lock housing, each control ring being provided with a latch groove receiving that part of the latch which prevents rotation of the cylinder;

the said chordally disposed latch channel being capable of receiving the other part of the latch only in a state of magnetic equilibrium determined by the polarisation of the magnetic elements in the proper key and the magnetic elements of the rotor;

the arrangement being such that when a proper key is fitted into the keyhole the latch is disposed partly in the rotor housing and partly in the rotor support and in this position the cylinder is freely rotatable while when the proper key has been removed the latch channel in the housing of the rotor is disposed outside the line of action of the latch and the latch is disposed in the rotor support and in the latch grooves of the control rings and a latch groove for ensuring the locking position of the latches is formed in the lock housing along the line of the latch grooves of the control rings.

4,576,026

CYLINDER LOCK HAVING COUPLING MEANS

Prunbauer Kurt, Herzogenburg, and Erich Csapo, Vienna, both of Austria, assignors to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Gesellschaft m.b.H. & Co. Kommanditgesellschaft, Vienna, Austria

Filed Sep. 24, 1984, Ser. No. 653,913

Claims priority, application Austria, Oct. 18, 1983, 3714/83

Int. Cl.[4] E05B *17/04*

U.S. Cl. 70—380 **4 Claims**

1. A cylinder lock having a housing, a cylinder core supported in the housing for rotation about an axis, and a coupling device for transmitting the rotary movement of the cylinder core to an additional lock structure, the coupling device comprising a radial bore in a free end portion of the cylinder core; a spring biased snap pin arranged in the radial bore; a coupling sleeve slidably mounted on the free end portion of the core; a radial slot formed in a circumferential portion of the sleeve to engage in an angular position of the sleeve the snap pin and to permit a free angular displacement of the cylinder core relative to the sleeve over the length of the radial slot; a bore formed in

the sleeve to engage in another angular position of the cylinder core the snap pin and connect the coupling sleeve for joint rotation with the cylinder core; and a locking beam connected to the coupling sleeve for rotation about said axis.

4,576,027

ROLLING MILL

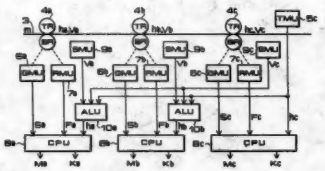
Fumio Yoshida, and Yoshikazu Kotera, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,545

Claims priority, application Japan, Feb. 25, 1983, 58-31202

Int. Cl.[4] B21B *37/12*

U.S. Cl. 72—11 **9 Claims**



1. A rolling mill for rolling an elongated transferring material continuously through at least a pair of rolls opposed to each other with a gap forming therebetween, said rolling mill including:

a plurality of measuring means for measuring data, including size of the material, the gap between the rolls, and the reaction force exerted on the rolls, associated with said rolls; and

arithmetic processing means connected to said measuring means for receiving and utilizing said data during a plurality of successive sampling periods from said measuring means to execute a predetermined arithmetic processing to separately calculate the most reliable values of a mill modulus which said rolling mill possesses and an offset of said gap, and providing the values as input data for controlling said rolls, said arithmetic processing means being provided for each of said pair of rolls.

4,576,028

METHOD OF MAKING A COIL SPRING AND APPARATUS THEREFOR

Motoo Morita, Nagoya, Japan, assignor to Morita Iron Works Co., Ltd., Aichi, Japan

Filed Aug. 31, 1984, Ser. No. 646,018

Claims priority, application Japan, Sep. 1, 1983, 58-160625

Int. Cl.[4] B21F *3/04*

U.S. Cl. 72—143 **35 Claims**

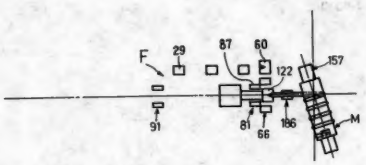
1. A method of making a coil spring wherein a wire material taken from a heating furnace is fed on a line of feed and formed

into a spring by use of a mandrel adapted to rotate on the basis of chucking position to wind the wire material, the mandrel being controlled to pivot into a predetermined angular winding position relative to the line of feed and to move in the axial direction thereof, comprising the steps of:

feeding the wire material at a selected speed continually in alignment with the line of feed;

regulating the orientation and position of the head end of the wire material in the forward part of the line of feed;

directing the wire material regulated on its head end to a chucking position established on the outer periphery of the mandrel and aligned with the line of feed;



controlling the mandrel to pivot about a fulcrum aligned with the chucking position and to shift between a reference position perpendicular to the plane of the line of feed and a winding position forming an acute angle relative to the reference position;

moving the mandrel toward and away from the predetermined winding position while removably holding the material; and

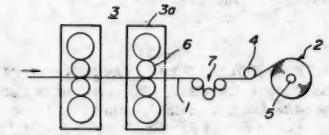
regulating the tail end of the wire material at a predetermined time during winding process so as to control the orientation of the tail end to an angle commensurate with the angle of twist of the wire material which will necessarily be developed before the remaining unwound length of the wire material is wound.

4,576,029

METHOD OF COILING THIN STRIPS

Hidenori Miyake; Shunji Fujiwara; Yoshio Nakazato; Fumiya Yanagishima, and Toko Teshiba, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 20, 1984, Ser. No. 633,130
Int. Cl.⁴ B21B *39/08*
U.S. Cl. 72—205 **1 Claim**



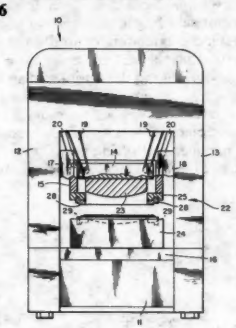
1. In a method of coiling a thin strip, the method being of the type comprising cold rolling a hot rolled steel strip through a last stand of a cold tandem mill, and coiling the cold rolled strip on a tension reel to form a coil, the improvement which comprises cold rolling the strip to a thickness of not more than 0.3 mm through the last stand of the cold tandem mill with the same roll diameter and the same speed between upper and lower work rolls thereof, and coiling the cold-rolled strip under a condition that tension bridle rolls are arranged between the last stand of the cold tandem mill and the tension reel to control delivery side tension of the last stand within a range of 5–16 kg/mm^2, and coiling tension within a range of 4–7 kg/mm^2.

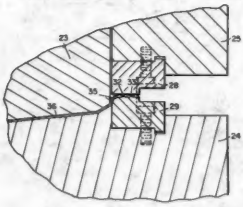
4,576,030

STRETCH FORM DIE

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Aug. 31, 1983, Ser. No. 528,067
Int. Cl.⁴ B21D *11/02*
U.S. Cl. 72—296 **14 Claims**





1. A stretch forming apparatus, comprising:

complementary male and female die halves moveable between open and closed positions, said dies being arranged to stamp a blank therebetween with the female die half being of a closed configuration;

a blank holder member moveable between open and closed positions relative to said female die half and mounted about the entire periphery of the male and female die halves; and

means on said blank holder, including a pair of grippers having mutually facing surfaces, one of said surfaces defining a blank holding surface and exactly two circumferential beads extending outwardly from and fixed relative to said blank holding surface in a direction towards the other of said facing surfaces, each of said beads including a sharp edge for biting into a sheet metal blank and the other of said facing surfaces lying entirely in a plane, for homogeneously stretching said sheet metal blank to form as said die halves are closed with the peripheral portions of the sheet metal blank extending outwardly of said beads fixedly held in position relative to said beads.

4,576,031

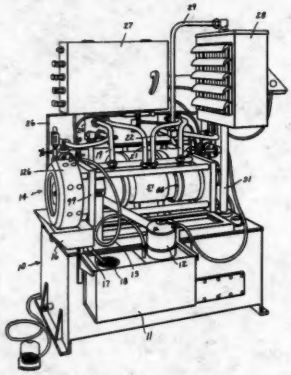
QUICK DISCONNECT ARBOR AND DIE HEAD FOR TUBE STOCK SIZING APPARATUS

Kenneth L. Resener, Indianapolis, Ind., assignor to Resener Machine & Tool Co., Inc., Indianapolis, Ind.

Filed Dec. 31, 1984, Ser. No. 688,068
Int. Cl.⁴ B21D *22/00*
U.S. Cl. 72—355 **7 Claims**

1. A tube stock sizing apparatus comprising a stationary annular member, a plurality of spaced finger members for

movement toward and away from the central axis of the annular member and spring biased toward said axis, said finger members extending parallel to the annular member axis with their outer surfaces being adapted to engage the inner bore of a section of tube stock to be sized, the inner surfaces of said finger members being inclined, spring biased quick disconnect means releasably engageable with said finger members and operable to mount said finger members to said annular member, a tapered spindle extending centrally through said finger members and engaging the inclined inner surfaces thereof, said spindle being movable along the axis of said annular member to displace said finger elements outwardly therefrom and into engagement with the tube stock, a plurality of spaced die elements for movement toward and away from the central axis of the annular member and spring biased away from said axis, the inner surfaces of said die elements being adapted to engage



the outer surface of a section of tube stock to be sized, the outer surfaces of said die elements being inclined, removable tool means releasably engageable with said die elements and operable to mount said die elements to said annular members, a ring member encircling said annular member and having an inclined inner surface engaging the inclined outer surfaces of said die elements, said ring member being movable along the axis of said annular member to displace said die elements inwardly toward said axis and into engagement with the tube stock, and means for moving said spindle and said ring member independently of each other, said means comprising a hydraulic cylinder centrally divided into a first and second working chamber and mounted coaxially with said stationary annular member, a piston in said first chamber having an operative connection to said spindle, a piston in said second chamber having an operative connection to said ring member.

4,576,032

CRIMPING PRESS CAPABLE OF CRIMPING TERMINALS ONTO A RANGE OF WIRE SIZES

Werner Maack, Seeheim; Georg Kampfmann, Darmstadt, and Peter Foerster, Egelsbach, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 30, 1984, Ser. No. 635,780

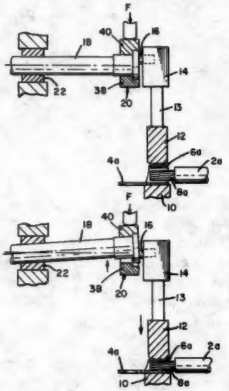
Int. Cl.[4] B21J *7/12*

U.S. Cl. 72—431 **5 Claims**

1. Crimping apparatus for crimping a terminal onto a wire, the apparatus being of the type comprising an anvil for supporting the terminal, a crimping die which is movable along a path of reciprocation towards and away from the anvil between a remote position and a shut height position, a rotatable power shaft having an axis which extends normally of the path of reciprocation, a mechanical coupling between the power shaft and the crimping die for moving the crimping die to and fro along the path of reciprocation during each revolution of the power shaft and for transmitting the crimping force from the power shaft to the crimping die, the apparatus being characterized in that:

the power shaft is pivotally movable in a direction perpendicular to its axis along the path away from the crimping die, the power shaft being supported against such movement by a resiliently yieldable shaft support,

the resiliently yieldable shaft support comprising a first shaft bearing which is located adjacent to the mechanical coupling and the biasing means, at least a portion of the first shaft bearing being movable with the power shaft away from the anvil, the biasing means being in engagement with the first bearing and biasing the first bearing towards the anvil,



the power shaft being pivotally movable with respect to a pivot axis which is spaced along the shaft axis from the first bearing, and

the yieldable shaft support is calibrated to resiliently yield upon development of a predetermined reaction force thereon during the final stages of a crimping operation, the predetermined reaction force being the force which is sufficient to crimp terminals onto wires which lie within a predetermined range of sizes whereby,

the apparatus can be used without adjustment or modification to crimp terminals onto wires within the range and the shut height of the crimping die will vary for wires and terminals of different sizes within the range.

4,576,033

THREAD ROLLING DIE CONSTRUCTION

Richard H. Corrette, Cleveland, Ohio, assignor to Colt Industries Operating Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 366,979, Apr. 9, 1982, abandoned. This application Dec. 7, 1983, Ser. No. 558,947

Int. Cl.[4] B21H *3/06*

U.S. Cl. 72—469 **2 Claims**

1. A cut-off die for pointing and threading unpointed blanks having a cylindrical shank comprising a block having a working face extending from a start end to a finish end, said working face providing:

a G-surface extending from said start end to said finish end operable to produce threads on a cylindrical portion of a fastener produced from said blanks;

a rise angle surface angled forwardly from one edge of said G-surface operable to form and thread a point on said fastener, said rise angle surface terminating in an edge extending along the length of said block, said G-surface being located in a forward area of said die such that the

forwardly angled rise angle faces toward said forward area; and

a cut-off surface operable to separate a slug of excess material at the pointed end of said fastener from said blanks, said cut-off surface being angled rearwardly from the edge of said rise angle surface remote from said G-surface, said cut-off surface being in nonparallel relationship to said G-surface;

said G-surface and said rise angle surfaces intersecting along a heel line;

said G-surface providing increasing width in the direction toward said finish end along at least a portion thereof laterally aligned with said rise angle surface causing said heel line to be angulated with respect to the length of said working face along said portion and operating to reduce pressure on said G-surface and rise angle surface, said G-surface having a uniform width along a second portion thereof laterally aligned with said rise angle surface substantially adjacent to said start end.

4,576,034

ADJUSTABLE RADIUS APPARATUS FOR CALIBRATING ULTRASONIC TRANSDUCER ARRAY

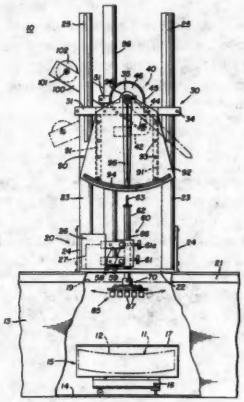
Herbert E. Ferree, Hempfield Twp.; Daniel E. Klinvex, McKeesport, and Robert P. Vestovich, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1984, Ser. No. 584,226

Int. Cl.⁴ G01C *25/00*

U.S. Cl. 73—1 DV **15 Claims**

1. Calibration apparatus for calibrating an ultrasonic transducer array by moving it along an arcuate calibration test member, said apparatus comprising: a frame including four upstanding posts in a rectangular arrangement disposable adjacent to the test member, carriage means including a framework extending between and interconnecting said posts and being mounted for sliding vertical movement there along and defining a pivot axis extending through the center of curvature of the test member, means for changing the position of said carriage means on said frame for varying the position of said pivot axis with respect to the test member thereby to accommodate test members with different radii of curvature, an elongated pendulum arm mounted on said carriage and depending therefrom for pivotal movement about said pivot axis, drive means for effecting pivotal movement of said pendulum arm, and attachment means for mounting the transducer array on the lower end of said pendulum arm, whereby pivoting of said pendulum arm effects movement of the transducer array along



the arcuate test member at a fixed predetermined distance therefrom.

4,576,035

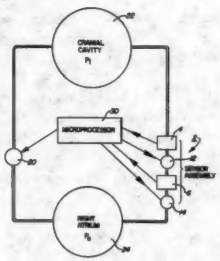
SELF-CALIBRATING DIFFERENTIAL CONDITION SENSOR

Michael D. Hooven, and Stanley H. Saulson, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 568,537, Jan. 5, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 763,891

Int. Cl.⁴ G01L *27/00*

U.S. Cl. 73—4 R **8 Claims**



1. A method for calibrating a differential physical condition measurement, which comprises the steps of:

coupling, to a first element having a first variable physical condition, a first sensing device adapted to detect the magnitude of said first condition;

coupling, to said first element, a first valve and a second sensing device adapted to detect the magnitude of said first condition when said first valve is open, said second sensing device being operable independent of said first sensing device;

coupling, between a second element having a second variable physical condition and said second sensing device, a second valve whereby said second sensing device is adapted to detect the magnitude of said second condition when said second valve is open;

controlling said first valve and said second valve to (a) open said first valve and close said second valve whereby said first sensing device and said second sensing device both

sense said first variable physical condition to obtain an error factor, and (b) close said first valve and open said second valve whereby said first sensing device senses said first variable physical condition and said second sensing device senses said second variable physical condition in order to obtain a condition difference amount; and

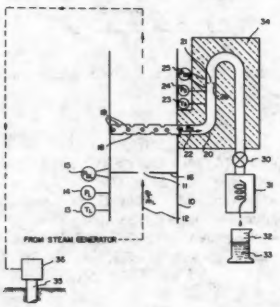
algebraically subtracting said error factor from said condition difference amount to obtain a corrected differential condition amount.

4,576,036

METHOD AND APPARATUS FOR DETERMINING QUALITY AND MASS FLOW RATE OF FLOWING STEAM

Wann-Sheng Huang; Donald S. Mims, and Richard S. Allen, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 3, 1984, Ser. No. 606,789
Int. Cl.⁴ G01N *25/60*
U.S. Cl. 73—29 **9 Claims**



8. Apparatus for determining the quality and the two-phase mass flow rate of steam containing both liquid and vapor components and flowing in an orifice-containing steam line comprising:

steam sampling means for drawing off through an orifice-containing sample conduit from said steam line a sample of said steam having substantially the same quality as said line steam,

means for measuring the temperature in said sample conduit,

means for measuring the static pressure in said sample conduit,

means for measuring the differential pressure across said sample conduit orifice,

means connected to said sample conduit for measuring the two-phase mass flow rate of said drawn off sample of steam,

such that said sample steam quality may be determined by means of an equation relating said measured sample conduit temperature, static pressure, differential pressure, and two-phase mass flow rate, said determined sample steam quality being substantially the same as said desired line steam quality,

means for measuring the temperature in said steam line,

means for measuring the static pressure in said steam line, and

means for measuring the differential pressure across said steam line orifice,

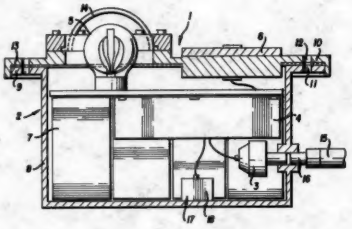
such that said line steam two-phase mass flow rate may be determined by means of an equation relating said measured steam line temperature, static pressure, and differential pressure, and said line steam quality which is substantially the same as said determined sample steam quality.

4,576,037

LEAK DETECTORS

Andrew P. D. Cox, Grimsby, England, assignor to Dunlop Limited, London, England

Filed Apr. 19, 1984, Ser. No. 601,913
Claims priority, application United Kingdom, Apr. 27, 1983, 8311474
Int. Cl.⁴ G01M *3/28*
U.S. Cl. 73—40.5 R **11 Claims**



1. A leak detector for mounting externally of a flexible hose and operable in response to the pressure of fluid leaking through at least a part of the flexible hose to generate warning signal, said leak detector comprising test means for checking the operating capability of the detector, and means for operating said test means from outside of the detector.

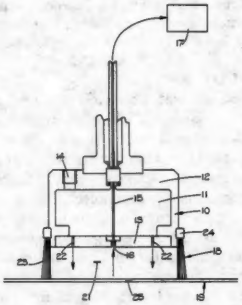
11. A flexible hose assembly comprising a flexible hose having main fluid retaining carcass and a secondary fluid retaining carcass secured to a rigid end fitting, and mounted externally of the hose a leak detector operable in response to the pressure of fluid leaking through at least a part of the flexible hose to generate warning signal, said leak detector comprising test means for checking the operating capability of the detector, and means to operate said test means from outside of the detector.

4,576,038

APPARATUS FOR USE IN LEAK DETECTION

Derek Dixon, Liecester, and Barry A. Richardson, Rugby, both of England, assignors to John Brown Automation Limited, Binley, England

Filed Sep. 14, 1984, Ser. No. 650,725
Claims priority, application United Kingdom, Sep. 20, 1983, 8325107; Jan. 11, 1984, 8400643
Int. Cl.⁴ G01M *3/20*
U.S. Cl. 73—40.7 **7 Claims**



1. Apparatus for use in the detection of leaks comprising an annular flexible, gas permeable skirt carried by and projecting from a carrier member which closes one axial end of the skirt, the opposite axial end of the skirt being closed in use by en-

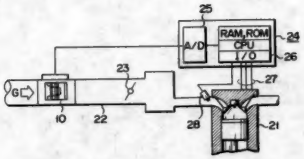
gagement with the surface being searched, such that said surface and said carrier member contain between them a sample volume bounded by said skirt, and, a sensing probe communicating with said sample volume for detecting the presence of a signal gas in said sample volume wherein the region of the carrier member with the confines of the skirt, which defines a closure for said one axial end of the skirt, is formed with one or more apertures through which gas can be supplied to or drawn from said sample volume.

4,576,039

AIR-FLOW DETECTING APPARATUS

Yukio Muto, Oobu; Masumi Kinugawa, Okazaki, and Tomoaki Abe, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 20, 1984, Ser. No. 591,378
Claims priority, application Japan, Mar. 24, 1983, 58-49423
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **9 Claims**



1. An air-flow detecting apparatus comprising:
(a) an air-flow detecting sensor including a support frame made of heat-resistant insulating material, a heating line supported by the support frame, and a resistance line also supported by the support frame and located on the lower side, in relation to the heating line when viewed from the direction in which air flows, said resistance line having a temperature resistance characteristic which allows it to serve as a thermometer;
(b) means for measuring and detecting an output signal of the sensor at predetermined intervals, said output signal being changed corresponding to changes in the air-flow;
(c) means for setting transmitting coefficients, corresponding to a transmitting characteristic of the sensor, based on the time delay for the amount of actual input air to appear as an output of the sensor in relation to the coefficients for a delay line; and
(d) means for obtaining an air-flow measuring output signal in such a way that a detection signal supplied from the sensor is subjected to inverse transformation using the transmitting coefficients set by setting means in response to the previously determined air-flow measuring output signal.

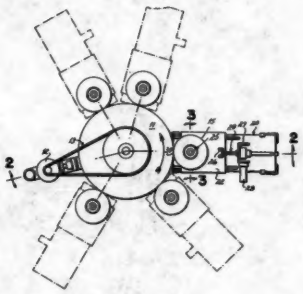
4,576,040

DEVICE FOR MEASURING EXTRANEOUS LOSSES IN APPARATUS FOR MEASURING THE ROLLING RESISTANCE OF TIRES

Barry D. Cargould, Akron, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jun. 29, 1983, Ser. No. 508,939
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **3 Claims**

1. In apparatus for measuring the rolling resistance of tires, having a mechanism for mounting a tire against a moving surface and means for measuring the tire's rolling resistance, a spindle drag measuring mechanism comprising,
a spindle on which said tire is mounted,
an inner bearing housing in which said spindle is rotatably mounted,
an outer bearing housing in which said inner housing is mounted for limited rotation, said outer housing being fixedly mounted,



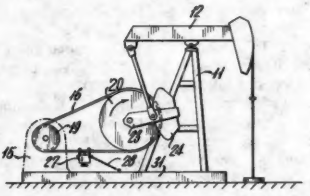
and a load cell restraining rotary movement of said inner housing with respect to said outer housing, said load cell determining the drag forces associated with the rotating spindle and caused by bearings and the like.

4,576,041

DYNAMIC BALANCING MEANS FOR AN OIL WELL PUMPING UNIT

Roy D. Martin, Albert, Kans., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,441
Int. Cl.[4] G01L *3/14, 5/06*
U.S. Cl. 73—151 **3 Claims**



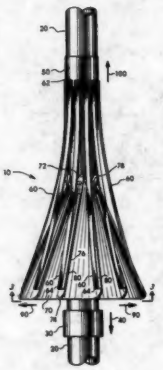
1. In combination with an oil well pumping unit having a pump jack driven by an internal combustion engine with a belt connecting said pump jack to said engine,
means for dynamically balancing said pumping unit, comprising
means for indicating tension being applied to said belt while said pumping unit is running throughout at least one full cycle of said pump jack, and
means for restraining said tension indicating means against movement with said belt,
said tension indicating means comprising
(a) a frame having a pair of guide pulleys thereon,
(b) a tension pulley between said guide pulleys,
(c) pantograph means for attaching said tension pulley to said frame,
(d) spring means for biasing said tension pulley toward said belt,
(e) means for adjusting said spring bias,
(f) an elongated pointer pivotally mounted at the base thereof,
(g) a crank arm attached to said pointer at said base thereof, and
(h) pivotal linkage means connecting said pantograph means to said crank arm for indicating the tension on said belt.

4,576,042

FLOW BASKET

Irvin D. Johnson, Englewood, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 26, 1984, Ser. No. 686,514
Int. Cl.[4] E21B 47/00
U.S. Cl. 73—155 16 Claims



1. A flow basket (10) connected to a shaft (20) for use in a bore hole to measure flow rates, said flow basket (10) comprising:

a plurality of petals (70), each of said petals being substantially triangular in shape and having one linear edge (76) located between an enlarged petal end (74) and a narrow terminal end (72), said plurality of petals (70) being arranged around said shaft (20) so that said petals overlap each other in order for said petals to open and close about said shaft,

first means (78) connected to said terminal end (72) of said petals (70) for engaging said shaft (20) at a first predetermined location (B) on said shaft (20),

a plurality of support ridges (80) with each support ridge (80) attached to one of said petals (70) along said linear edge (76), each said support ridge (80) being an elongated rectangle in shape and extending from a region near said terminal end (72) to a region near said petal end (74) of each said petal (70),

a plurality of support bows (60) with each support bow (60) attached at one end (64) to said petal end (74) of said petal at a predetermined location (A) next to said attached support ridge (80), said support bow (60) extending over said first predetermined location (B) on said shaft (20) and having its opposing end (62) engaging said shaft (20) at a second predetermined location (C) on said shaft (20), and

second means (50) connected to the opposing end (62) of said support bow (60) for engaging said shaft (20) at said second predetermined location, said first (78) and second engaging means (50) being capable of relative movement with respect to each other along said shaft (20) as said petals (70) open and close so that each said petal (70) is opened in an outward radial direction (600) only.

4,576,043

METHODS FOR METERING TWO-PHASE FLOW

Tanh V. Nguyen, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 17, 1984, Ser. No. 611,455
Int. Cl.[4] G01F 1/76, 1/36
U.S. Cl. 73—195 2 Claims

1. A method for metering two-phase flow in a pipeline comprising the steps of:

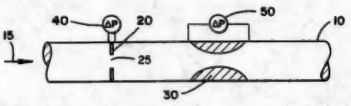
installing a venturi in the pipeline;

coupling an orifice plate in series with the venturi in the pipeline;

introducing two-phase flow into the pipeline;

measuring the two-phase pressure drop across the venturi;

measuring the two-phase pressure drop across the orifice plate; and



correlating the two-phase pressure drop across the venturi as determined by a first set of equations with the two-phase pressure drop across the orifice plate as determined by a second set of equations to obtain one or more two-phase flow rate parameters, wherein said first set of equations comprises:

$$\frac{1}{X} = \left(\sqrt{\frac{\rho_l}{\rho_g}}\right)\left(\frac{x}{1-x}\right),$$

$$\Delta p_l = \frac{\Delta p}{1 + C\left(\frac{1}{X}\right) + \left(\frac{1}{X}\right)^2}, \text{ and}$$

$$W = \frac{K\sqrt{\rho_l \Delta p_l}}{1-x},$$

and wherein said second set of equations comprises:

$$F_p = D^2 \frac{\left(\sqrt{\rho_g \Delta p}\right)}{W},$$

$$F_p = ax^b, \text{ and}$$

$$W = \frac{D^2}{a}\left(\sqrt{\rho_g \Delta p}\right) x^{-b}$$

where:

1/X=Martinelli's parameter,

x=quality,

ρ_l=the density of a liquid phase,

ρ_g=the density of a gaseous phase,

Δp=the measured two-phase pressure drop across the device to which the equation is applied,

C=a correlation coefficient based upon calibration data,

W=the two-phase mass-flow rate,

K=an orifice coefficient for the venturi,

F_p=a flow parameter,

D=the diameter of the orifice,

a=a first constant determined from calibration data, and

b=a second constant based on calibration data.

4,576,044

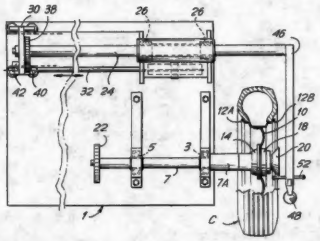
WHEEL BALANCING APPARATUS

Fabio Boni, Via Faentina 96, 50030 Ronta fraz. Borgo S. Lorenzo, Firenze, Italy

Filed Apr. 25, 1984, Ser. No. 603,582
Claims priority, application Italy, May 6, 1983, 9418 A/83
Int. Cl.[4] G01M 1/22
U.S. Cl. 73—462 2 Claims

1. In an apparatus for balancing wheels including a hub disc defining a wheel axis and having inner and outer peripheral edges and a pneumatic tire mounted between said edges, the

apparatus including, a frame, a shaft mounted in said frame on said wheel axis for rotating the wheel, sensing means spaced from one another along said shaft for obtaining dynamic and positional data on any imbalance of the wheel, and computing means, the improvement comprising a feeler arm mounted to said frame so as to be angularly movable about an arm axis and also movable along said arm axis, said arm axis being parallel to said wheel axis and spaced radial therefrom by at least a distance corresponding to a maximum radius of a wheel with tire to be measured, said feeler arm having contact means for contacting said edges of said hub disc, means for detecting the axial and angular position of said arm, to obtain data on the



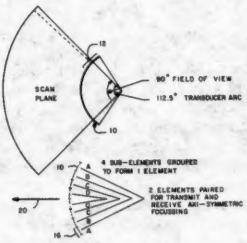
diameter of said hub disc and the axial distance between said edges, said computing means receiving data from said sensing means and said detecting means and deriving information therefrom on the position and the amount of imbalance in the wheel, a slidable and angularly movable rod mounted in said frame, extending on said arm axis and by means of which said arm is mounted to said frame, said detecting means including two potentiometers associated with said rod for detecting the axial and angular position of said rod and therefore of said feeler arm, and said contact means including two opposite, transversely extending feelers intended to rest respectively and in succession on the two edges of the hub disc of the wheel, substantially at one and the same radial position of the wheel.

4,576,045

WIDE APERTURE ULTRASONIC SCANNER EMPLOYING CONVEX TRANSDUCER ARRAY

Stockton M. Miller-Jones, Rancho Cordova, Calif., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1983, Ser. No. 566,865
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—626 **2 Claims**



1. A wide aperture ultrasonic scanner comprising

a plurality of transducer sub-elements arranged in a convex array, each sub-element having a major surface for transmitting and receiving ultrasonic waves, said major surfaces being positioned outwardly in said convex array,

means for activating adjacent sub-elements in a group as a plurality of phase activated elements to define a scan vector, each phase activated element comprising an equal number of adjacent sub-elements having the same phase, said means for activating said sub-elements including a plurality of switching circuits connected to said plurality of sub-elements, each switching circuit including a plurality of first switch means connected in parallel, each of said first switch means being controllable by a phase signal, and a second switch means connected in series with said plurality of first switch means and a sub-element, said second switch means being controllable by a vector address signal, and

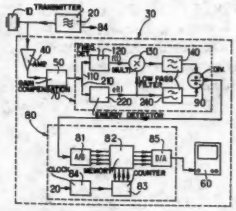
means for incrementing sub-elements in said group from one vector to the next vector by one sub-element to thereby define a plurality of vectors.

4,576,046

DEVICE FOR THE EXAMINATION OF OBJECTS BY MEANS OF ULTRASOUND ECHOGRAPHY

Mathias A. Fink, Strasbourg, and Jean-Francois Cardoso, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,415
Claims priority, application France, Dec. 14, 1983, 83 20042
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—631 **4 Claims**



1. A device for the scanning of objects by means of ultrasound echography, comprising at least one ultrasound transducer which is connected to a transmitter stage for the transmission of electric signals which are to be converted into acoustic waves by the transducer, and also to a receiver and processing stage for the reception and processing of ultrasound echoes which occur after reflection of said waves from obstacles encountered in their propagation direction, said receiver and processing stage comprising an amplifier, a correction circuit for the correction of the gain as a function of time, and a processing stage for processing of the results of the echographic examination, wherein as an improvement the receiver and processing stage comprises, connected to the assembly formed by the amplifier and the gain correction circuit, means for determining the instantaneous frequency and the instantaneous energy of the echographic signal, means for weighting the instantaneous frequency with the instantaneous energy, and means for diffraction correction.

4,576,047

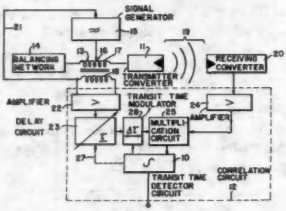
APPARATUS FOR DETERMINING THE TRANSIT TIME OF ULTRASONIC PULSES IN A FLUID

Reinhard Lauer, Waldkirch, and Werner Hartmann, Emmendingen, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,250
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316631
Int. Cl.⁴ G01F *1/66*; G01N *29/02*
U.S. Cl. 73—597 **4 Claims**

1. Apparatus for determining the transit times of ultrasonic

pulses in a fluid, in particular in a gas, the apparatus comprising at least two electroacoustic converters arranged spaced apart from each other along a measurement path extending through the fluid, one converter transmitting ultrasonic pulses along the measurement path while the other converter receives the



pulses which have tranvelled along the measurement path, both converters being connected to a correlation circuit having an input, in order to determined the transit times of the pulses, an electrical signal proportional to generated sound pressure being derived from the respective transmitting converter and applied to the input of the correlation circuit.

4,576,048

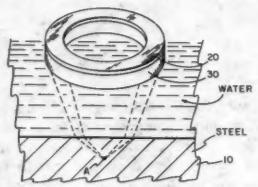
METHOD AND APPARATUS FOR ULTRASONIC INSPECTION OF A SOLID WORKPIECE

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Continuation-in-part of Ser. No. 429,013, Sep. 30, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 622,227

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—642 **35 Claims**



1. A method for non-destructive inspection of a solid workpiece, comprising the steps of:

generating ultrasound energy at a curved arc;

focusing said ultrasound energy into a substantially cone-shaped hollow sector beam;

directing said beam at a surface of the workpiece so as to establish shear mode ultrasound energy in the workpiece;

receiving ultrasound energy from within the workpiece.

4,576,049

PRESSURE SENSOR WITH RINGED CHAMBER

Rainer Köhnlechner, Schloss-Holte, Fed. Rep. of Germany, assignor to Ermeto Armaturen GmbH, Bielefeld, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,394

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313261

Int. Cl.⁴ G01L *7/08, 9/06*

U.S. Cl. 73—706 **14 Claims**

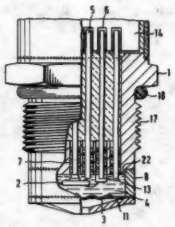
1. A device for measuring pressure in a fluid system, said device comprising:

a housing that includes a ring system having a radial boring, said housing having a pressure chamber and a non-pressurized chamber, said pressure chamber being connected to said non-pressurized chamber by borings;

electrical contacts and connecting posts that are located in said borings;

an electronic circuit that is located in the non-pressurized chamber of said housing and that is electrically connected to said electrical contacts;

a pressure sensor located in the pressure chamber of said housing and that is electrically connected to said electrical contacts;



a pressure transferring membrane that separates said pressure chamber from the fluid system, said membrane contacting the ring system of said housing and cooperates with said ring system to define the pressure chamber;

an incompressible, pressure transmitting medium that fills said pressure chamber; and

an element that seals the radial boring of said ring system.

4,576,050

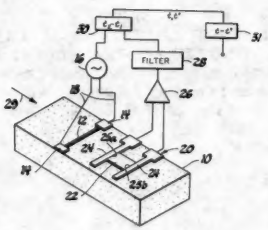
THERMAL DIFFUSION FLUID FLOW SENSOR

David K. Lambert, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1984, Ser. No. 645,253

Int. Cl.⁴ G01F *1/68;* G01P *5/10*

U.S. Cl. 73—861.05 **10 Claims**



1. A gas flow sensor for location contiguous to a body of gaseous fluid subject to flow to be measured, comprising:

a substrate having a thermal diffusivity substantially less than that of the fluid and having a thermal conductivity substantially greater than the fluid;

a thermal oscillation source on the surface of the substrate for generating thermal oscillations in the fluid, whereby thermal oscillations are propagated through still fluid at a first rate and through flowing fluid at a second rate dependent on fluid flow to substrate surface locations spaced from the source;

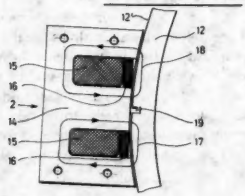
thermal oscillation detector means on the substrate surface near the oscillation source for providing at least one signal corresponding to the thermal oscillations at the detector means; and

signal responsive means coupled to the detector means for sensing the first and second rates and producing an output correlated to the mass gas flow near the substrate surface.

4,576,051
ERGOMETER HAVING AN EDDY CURRENT BRAKE SERVING AS A LOADING DEVICE

Peter Lautenschläger, Gonbach, Fed. Rep. of Germany, assignor to Keiper Dynavit GmbH & Co., Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,178
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315441
Int. Cl.⁴ G01L *3/10*
U.S. Cl. 73—862.36 **16 Claims**



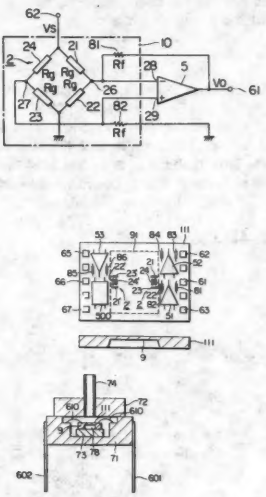
1. An ergometer having an eddy current brake serving as a loading device, comprising:
- a rotatably mounted brake wheel placed into rotation by means of a drive device and having a cylindrical ring made from an electrically conductive material; and
- a stationary magnet system having an air gap disposed between the poles of the magnet system directed toward the ring and the ring itself;
- wherein the air gap is provided between the outer cover surface of the ring and the poles of the magnet system facing the outer cover surface;
- wherein depressions running laterally to the direction of movement are provided in the surface of the brake wheel arranged at one side of the air gap opposite the poles to the magnet system, and that the magnet system supports a measurement coil permeated by the magnetic flux which closes over the brake wheel.

4,576,052
SEMICONDUCTOR TRANSDUCER

Susumu Suglyama, Aichi, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 24, 1984, Ser. No. 613,968
Claims priority, application Japan, May 26, 1983, 58-91443
Int. Cl.⁴ G01D *3/04*; G01L *9/06*
U.S. Cl. 73—862.63 **24 Claims**

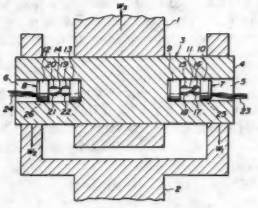
1. A semiconductor transducer comprising,
- a monocrystalline silicon substrate,
- a strain sensitive region formed on said monocrystalline silicon substrate and having a major surface,
- at least one strain gage integrally formed on the major surface of said strain sensitive region,
- a bridge circuit including said strain gage, said bridge circuit having an output terminal,
- an operational amplifier having an inverting input terminal connected to the output terminal of the bridge circuit, and at least one first parallel-connected resistor having two ends one connected to said inverting input terminal and the other to an output terminal of said operational amplifier, said parallel-connected resistor having a temperature coefficient of resistance set to be substantially the same as the difference between the temperature coefficient of resistance of said strain gage and the temperature coefficient of sensitivity thereof, said bridge circuit, said operational amplifier and said first parallel-connected resistor being formed on said monocrystalline silicon substrate.



4,576,053
LOAD DETECTOR

Yotaro Hatamura, 12-11, Kohinata 2-chome, Bunkyo-ku, Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,490
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 73—862.66 **8 Claims**



1. A load detector, comprising:
- a pin-like member arranged between force-transmitting members and adapted to receive a load;
- a hole formed in the pin-like member along a neutral axis thereof for bending deformations thereof;
- an insertion member inserted in the hole and having at both end parts thereof undeformable securement portions coupled for surface-to-surface contact with the pin-like member and including at a central part thereof at least one deformation-sensing portion which is located between said undeformable securement portions and is provided with an axis of symmetry thereof coincident or nearly coincident with the neutral axis of the pin-like member, wherein said at least one deformation sensing portion is responsive to each load applied to the pin-like member and undergoes deformation and hence enlarges resulting strain; and

means for converting the extent of deformation of the deformation-sensing portion of the insertion member into signals so as to obtain only a portion of the resulting strain which portion has been produced by each shear deformation of the pin-like member.

4,576,054

DUAL MODE GAS SAMPLER AND PNEUMATIC FLOW CONTROL SYSTEM

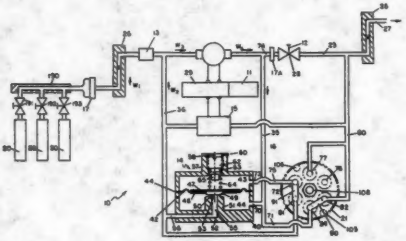
Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470

Continuation-in-part of Ser. No. 512,935, Jul. 12, 1983, Pat. No. 4,532,814. This application May 21, 1984, Ser. No. 612,334

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ G01N *1/24, 1/26*

U.S. Cl. 73—863.03 **17 Claims**



1. A pneumtic flow control system for collecting gas samples in a collecting device at a constant preselected flow rate comprising a vacuum pump having a suction side and a discharge side, with said collecting device connected to the suction side of said pump, a flow control valve having a flow restricting orifice with one side connected to the atmosphere and with the other side connected to the discharge side of said pump in series with said pump and said collecting device and a flow controller including means connected across the pump for diverting a supplementary flow of gas from the discharge side of the pump into the pump suction side and valve means responsive to the pressure differential across said flow control valve for regulating said supplementary flow so as to maintain the gas flow rate through said collecting device constant at said preselected flow rate independent of load variations.

4,576,055

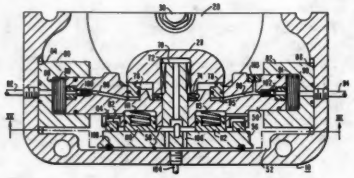
HYDRAULICALLY CONTROLLED INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic, Inc., Austin, Tex.

Filed Aug. 15, 1984, Ser. No. 641,046

Int. Cl.⁴ F16H *15/08, 15/00*

U.S. Cl. 74—200 **10 Claims**



1. An infinitely variable traction roller transmission comprising a housing, coaxial, input and output shafts rotatably supported in said housing; two toric discs supported opposite each other, one by said input and the other by said output shaft; said toric discs having opposite toric surfaces defining therebetween a toric cavity of circular cross-section, at least two motion transmitting traction rollers disposed between, and in engagement with, said toric discs for the transmission of motion therebetween; each of said traction rollers being rotatably supported by trunnions retained in said housing pivotally about pivot axes so as to permit changing of the ratio of motion transmission between said input and output toric discs, said housing having a partially cylindrical wall forming a support cavity adjacent each trunnion and having a center of curvature coinciding essentially with the pivot axis of the adjacent trunnion, and a seal plate disposed in said support cavity adjacent said trunnion, said seal plate having on one side a first fluid cavity defined by a partially cylindrical seal area in sealing engagement with said partically cylindrical housing wall and, on the other side, a flat sealing area engaged by a trunnion seal defining a second fluid cavity, so as to seal said trunnion relative to said seal plate while permitting relative movement between said trunnion and said seal plate; and means for admitting pressurized fluid to said support cavity.

4,576,056

ROTARY ASSISTANCE MECHANISM, PARTICULARLY FOR VEHICLE STEERING

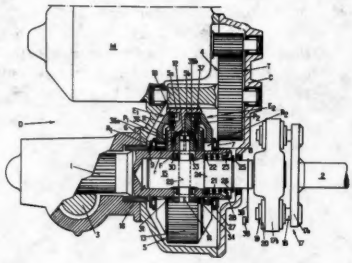
André Barthélemy, Saint Remy-lès-Chevreuse, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Jul. 16, 1982, Ser. No. 398,873

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.⁴ F16H *35/00;* **B62D** *3/00, 7/00, 9/00*

U.S. Cl. 74—388 PS **10 Claims**



1. A rotary assistance mechanism adapted to be coupled to a driven member capable of rotating alternately in two directions in response to the rotation of a drive shaft, comprising:

(a) a rotary assistance motor,

(b) reducing means for reducing a speed of said motor,

(c) two clutches associated respectively with said two rotational directions and each having a drive clutch member capable of being driven by said motor and a driven clutch member, and

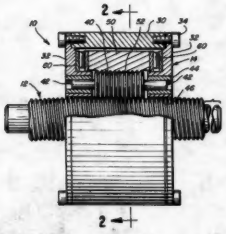
(d) control means for controlling said clutches to actuate one of said clutches depending on a direction and amplitude of a torque applied to the drive shaft such that said driven member is driven by said motor through said reducing means in a desired direction by means of said actuated clutch, said driven clutch members of said two clutches being rotatably connected to the driven member by means of two respective unidirectional coupling means corresponding respectively to both said opposite rotation directions of said driven member such that said respective unidirectional coupling means operate respectively to impart opposite directions of rotation to said driven member and such that the driven member is rotatably driven by an actuated clutch but a non-actuated clutch will not be driven by the driven member.

4,576,057

ANTI-FRICTION NUT/SCREW DRIVE

Oliver Saari, Minneapolis, Minn., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 13, 1984, Ser. No. 620,355
Int. Cl.[4] F16H *1/18, 1/20, 27/02, 29/02*
U.S. Cl. 74—424.8 C **19 Claims**



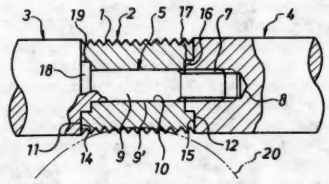
1. An improved anti-friction screw-nut device including a nut assembly, a threaded screw having a plurality of leads extending through said nut assembly, said nut assembly including housing means, a plurality of elongate rollers equal in number to the number of leads on said screw, each of said rollers having a plurality of annular grooves forming a plurality of annular ring-like teeth conjugate to the threads of said screw, means cooperatingly locating said rollers in circumferentially spaced relation to said nut assembly and said screw, a freely rotatable ring having annular grooves for engaging and retaining said rollers in radial engagement with said screw, said ring being positioned intermediate the length of said rollers and having a width selected to provide sufficient contact between it and said rollers at a position intermediate the length of said rollers to distribute thrust over a selected area, and bearing means for transmitting thrust from said ring to said nut assembly.

4,576,058

WORM ASSEMBLY

Masakazu Matumoto, Osaka, Japan, assignor to Kabushiki Kaisha Nikken Kousakusho, Osaka, Japan

Filed May 14, 1984, Ser. No. 610,048
Int. Cl.[4] F16H *1/16, 1/20, 1/18, 55/17*
U.S. Cl. 74—425 **8 Claims**



1. A worm assembly comprising:

a first shaft adapted to be supported in a bearing and including an end and a bolt projecting coaxially from said end, said bolt including an intermediate portion and terminating in a screw portion,

a second shaft arranged coaxially with respect to said first shaft and adapted to be supported

in a bearing, said second shaft including an end spaced from said end of said first shaft and including a screw hole extending coaxially therein and threadedly receiving said screw portion of said bolt, and

a hollow cylindrical worm formed of hard metal which is harder than said first and second shafts, said worm sandwiched axially between said ends of said first and second shafts and including an inner throughbore which lies closely adjacent to said intermediate portion of said bolt which passes coaxially through said worm,

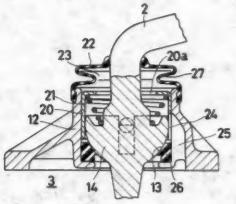
said worm being fixed against rotation relative to said first and second shafts.

4,576,059

SHIFT LEVER SUPPORT MECHANISM FOR TRANSMISSIONS

Mitsufumi Nishu, Chiryu; Kenji Takeuchi, Aichi; Masanori Sato, Nagoya; Ichiro Horiuchi, Chiryu; Katsuhiko Muramatsu, Toyota, and Koji Kiryu, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1984, Ser. No. 572,843
Claims priority, application Japan, Feb. 4, 1983, 58-014455[U]
Int. Cl.[4] G05G *9/12;* **B25G** *3/38*
U.S. Cl. 74—473 P **4 Claims**



1. A shift lever support mechanism for a transmission having a transmission casing and a gear shifting actuator shaft, comprising:

(a) a shift lever having a partly spherical pivot body and a distal end extending from said partly spherical pivot body for engagement with the gear shifting actuator shaft;

(b) a retainer member mountable on the transmission casing and having a bore accommodating said spherical pivot body therein, said retainer member including a partly spherical seat supporting said partly spherical pivot body, said retainer member having a central opening through which said distal end extends;

(c) resilient means disposed in said bore in said retainer member for normally urging said partly spherical pivot body against said partly spherical seat;

(d) a boot mounted on said shift lever and said retainer member and defining a space therein communicating with said bore in said retainer member; and

(e) said retainer member having a passage defined in a wall thereof adjacent to said partly spherical seat for communication between said space and the interior of the transmission casing.

4,576,060

BALANCES RUNNING ON GEARS FOR A MOTOR VEHICLE ENGINE

Nicholas Gristina, 4401 Knight Dr., New Orleans, La. 70127

Filed Oct. 1, 1984, Ser. No. 656,764
Int. Cl.[4] F16F *15/26;* **F02B** *75/06*
U.S. Cl. 74—573 R **20 Claims**

1. A mechanical mechanism comprising:

a crankshaft having first and second opposite end portions mounted for rotation about an axis, and having a third portion offset from said axis;

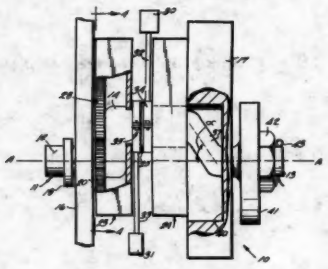
a first gear having teeth formed on the external circumferential periphery thereof, said gear mounted so that it is stationary with respect to said crankshaft;

a second gear having teeth extending inwardly from an internal peripheral portion thereof;

balancing means comprising said second gear, another body,

and a collar interconnecting said body and said second gear;

said third portion of said crankshaft received within said collar and rotatable with respect to said collar; and



said first and second gears intermeshing as said second gear revolves around said crankshaft axis.

4,576,061

SYSTEM FOR CONTROLLING THE TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

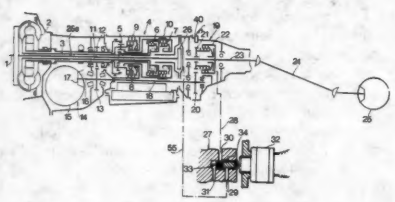
Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakakiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,719

Claims priority, application Japan, Dec. 16, 1982, 57-221347

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—665 T **6 Claims**



1. A system for controlling power transmission of a four-wheel drive vehicle powered by an engine comprising:

a transmission for transmitting power of said engine to main wheels of the vehicle;

a clutch for selectively transmitting said power to auxiliary wheels of the vehicle, whereby said main and auxiliary wheels are power driven;

first sensing means for sensing the speed of the vehicle and for producing vehicle speed signals as a function of the speed;

second sensing means for sensing the steering angle of the vehicle and for producing steering angle signals as a function of the steering angle;

control means responsive to said vehicle speed and steering angle signals for producing a clutch signal as a function of the vehicle speed and steering angle such that when the vehicle speed is low, said clutch signal is produced at a first steering angle, and as the vehicle speed increases, the steering angle for said clutch signal increases; and

switch means responsive to said clutch signal for disengaging said clutch, whereby the four-wheel drive is changed to the two-wheel drive.

4,576,062

HIGH EFFICIENCY GEAR TRANSMISSION

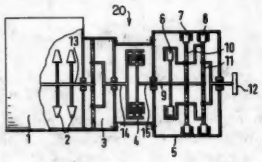
Rudi Reppert, Fussen; Franz X. Zaunberger, and Artur Kugler, both of Augsburg, all of Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk, A.G., Augsburg, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,848

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207938

Int. Cl.⁴ F16H *37/00*; F16D *23/00*

U.S. Cl. 74—740 **15 Claims**



1. A mechanical transmission comprising a speed change gearing shiftable under load, the speed change gearing having input means, output means and mechanical speed shift torque transmissible means interconnecting the input and output means, the speed shift torque transmissible means being selectively disengageable to provide a slip mode of operation between the input means and the output means, and a main synchronization means, the speed shift torque transmissible means including a mechanical wear component, the mechanical wear component being subject to increased wear during the slip mode of operation, the main synchronization means including a primary part drivable by an engine output shaft and a secondary part drivingly engaging the speed change gearing input means, mechanical main torque transmissible means interconnecting the primary and secondary parts, the main torque transmissible means including a non-fluid torque coupling operable from a driving nonslip mode of operation wherein its transmissible torque is at least as great as the engine output load torque and shiftable to a slip mode of operation wherein reduced torque is transmitted from the primary part to the secondary part, the non-fluid torque coupling including a mechanical wear component subject to increased wear during the slip mode of operation, the wear component of the torque coupling being constructed to withstand greater wear than the wear component of the speed shift torque transmissible means, the main torque transmissible means uninterruptedly transmitting no less than a minimal torque between the primary part and the secondary part, the transmissible torque of the main torque transmissible means being less than the transmissible torque of the speed shift torque transmissible means, the main synchronization means providing the greatest proportion of synchronization work required for a shifting cycle when changing gear speeds, the remainder of such synchronization work being provided by the speed shift torque transmissible means so that reduced size speed shift torque transmissible means are employable thereby maximizing speed change gear efficiencies, the transmission further including means for automatically regulating the transmission whereby the non-fluid torque coupling is automatically shiftable from the nonslip mode to the slip mode during each speed change shift of the speed change gearing.

4,576,063

TRANSMISSION MECHANISM WITH PARALLEL TRANSMISSION SYSTEMS INCLUDING ONE WAY CLUTCHES, ONE BEING LOCKABLE

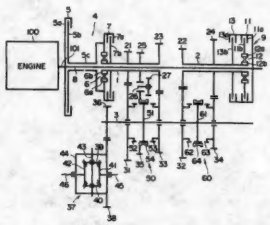
Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 11, 1983, Ser. No. 465,762

Claims priority, application Japan, Feb. 27, 1982, 57-31607; Jun. 22, 1982, 57-107086; Jun. 22, 1982, 57-107087

Int. Cl.⁴ F16H *3/10*

U.S. Cl. 74—745 **6 Claims**



1. A transmission mechanism comprising: an input shaft; an output shaft; a first on-off clutch; a second on-off clutch; a first one way clutch; a second one way clutch; a first gear train having a first reduction gear ratio; a second gear train having a second reduction gear ratio smaller than said first reduction gear ratio; a third gear train having a third reduction gear ratio smaller than said second reduction gear ratio; a fourth gear train having a fourth gear reduction gear ratio smaller than said third reduction gear ratio; a first synchronizer which connects said input shaft and said output shaft via a series connection of said first on-off clutch, said first one way clutch, and said first gear train when said first synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input shaft to said output shaft in a normal rotational direction and which connects said input shaft and said output shaft via a series connection of said first on-off clutch, said first one way clutch, and said third gear train when said first synchronizer is shifted to a second side of said neutral position so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction; and a second synchronizer which connects said input shaft and said output shaft via a series connection of said second on-off clutch, said second one way clutch, and said second gear train when said second synchronizer is shifted to a first side of a neutral position thereof so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction and which connects said input shaft and said output shaft via a series connection of said second on-off clutch, said second one way clutch, and said fourth gear train when said second synchronizer is shifted to a second side of said neutral position of said second synchronizer so as to transmit rotational power from said input shaft to said output shaft in said normal rotational direction.

4,576,064

COUPLING MECHANISM FOR WIND TURBINE

John A. C. Kentfield, Calgary, Canada, assignor to Her Majesty the Queen in Right of the Province of Alberta as represented by the Minister of Energy and Natural Resources, Edmonton, Canada

Filed Jul. 9, 1984, Ser. No. 628,880

Claims priority, application Canada, Aug. 6, 1984, 456,151

Int. Cl.⁴ F16H *35/08*; F04B *49/00*

U.S. Cl. 74—833 **4 Claims**

1. A coupling mechanism for connecting the rotating output shaft of a wind turbine, mounted on a tower, with a load rod to be reciprocated, comprising:

(a) means, connected with the shaft, for converting the variable speed rotational output of the shaft to a fixed amplitude reciprocating output, which has a variable frequency substantially proportional to the rotational speed of the shaft, and transmitting said output;

(b) a ground-supported pivot member and a first member pivotally mounted on said pivot member for pivoting in a vertical plane, said first member being connected to the means (a) for oscillation thereby;

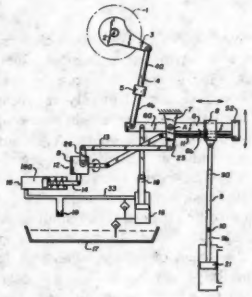
(c) a connector pivotally connected with the first member and being movable therealong, said connector further being connected with the load rod, whereby the load rod may be reciprocated at an amplitude varying with the position of the connection point of the connector with the first member and at a variable frequency substantially proportional to the rotational speed of the shaft;

(d) said means (a), (b), and (c) together forming means for driving the load rod; and

(e) a control and actuating assembly for varying the stroke length of the output of the driving means by adjusting the position of the aforesaid connection point, said assembly comprising:

(i) means, connected with the driving means, for transmitting a reciprocating power input from said driving means to the control and actuating assembly;

(ii) means, connected with and operating by the means (i), for generating a first force whose magnitude varies



substantially proportionally with the square of the wind velocity;

(iii) means for generating a second force whose magnitude is directly proportional to the position of the connection point of the connector with the first member;

(iv) a clutch assembly movable between first and second engaging positions and a neutral position;

(v) first and second drive assemblies connected with the connector and the clutch assembly, whereby the first drive assembly is operative to move the aforesaid connection point outwardly from the pivot member when the clutch assembly engages it in the first engaging position, and the second drive assembly is operative to move the aforesaid connection point inwardly toward the pivot member when the clutch assembly engages it in the second engaging position;

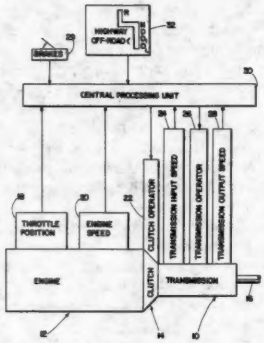
(vi) said means (ii) and (iii) being arranged to direct their forces in opposite directions on the clutch assembly so that a dominant force will cause the clutch assembly to engage one of the drive assemblies to move the connector in a particular direction until equilibrium of the forces causes the clutch assembly to assume the neutral position, whereby the amplitude of the reciprocating stroke of the load rod is maintained substantially in proportion with the square of the velocity of the wind at a frequency substantially proportional to the rotational speed of the shaft.

4,576,065

AUTOMATIC TRANSMISSION CONTROLS WITH MULTIPLE DOWNSHIFT OFF-HIGHWAY MODE

Donald Speranza, Canton; E. James Lane, Highland, and Ronald K. Markyvech, Allen Park, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 12, 1984, Ser. No. 649,630
Int. Cl.[4] B60K *41/18, 41/10*
U.S. Cl. 74—866 51 Claims



1. An improved automatic transmission system for vehicles having a throttle-controlled engine, an operator actuated throttling control means and a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said transmission input shaft being operatively connected to said engine, said transmission system including an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the position of said throttle controlling means, (2) an input signal indicative of the rotational speed of said engine, and (3) an input signal indicative of the speed of said vehicle, said processing unit including means for processing said input signals in accordance with a program to select a desirable gear ratio for a given combination of input signals and for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission effective to actuate said transmission to effect engagement of one of said gear ratio combinations in response to said output signals from said processing unit, the improvement characterized by:

said processing unit including means for processing said input signals to provide a calculated expected engine speed value indicative of the expected rotational speed of the engine at a selected vehicle speed in various selectable gear ratio combinations;

said program having a first mode of operation wherein upon sensing an engine speed equal to or less than the engine speed at which downshifts to a lower gear ratio are required is effective to:

(a) first compute a first expected engine speed value at the current vehicle speed and in the Nth lower gear ratio where N is an integer greater than 1;

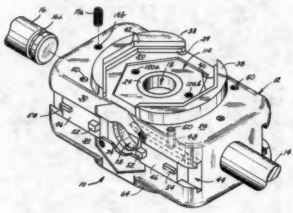
(b) then to command initiation of a downshift into a gear ratio intermediate the currently engaged gear ratio and the Nth lower than the currently engaged gear ratio if the first computed expected engine speed value is equal to or greater than the magnitude thereof at the maximum allowable speed of the engine and to command initiation of a downshift into the Nth lower gear ratio if the first computed expected engine speed value is less than the maximum allowable engine speed magnitude.

4,576,066

TOOL FOR REMOVING FASTENERS FROM SHOCK ABSORBER CYLINDERS

Kenneth D. Kloster, 6649 Millridge, Maumee, Ohio 43537

Continuation-in-part of Ser. No. 242,378, Mar. 10, 1981, abandoned. This application Mar. 16, 1983, Ser. No. 475,894
Int. Cl.[4] B25B *13/10, 13/56*
U.S. Cl. 81—176.3 8 Claims



1. A tool for removing a threaded fastener of the type employed to contain a vehicular shock absorber in an associated shroud, the shock absorber having a piston rod extending axially from one end of the shroud and through the associated fastener, the tool comprising:

a main body having at least one keyway formed to extend along a portion of the outer surface of said main body, a first piston rod receiving channel extending through said main body and terminating in said keyway, and a second piston rod receiving channel extending through said main body and intersecting said first channel; and

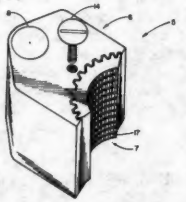
a pair of spaced apart keys slidably mounted in said keyway of said main body, each of said keys having a fastener engaging means formed thereon for engagement with the threaded fastener to effect removal of the fastener.

4,576,067

JAW ASSEMBLY

David A. Buck, 225 Highway 90 East, Broussard, La. 70518

Filed Jun. 21, 1984, Ser. No. 623,040
Int. Cl.[4] B25B *13/58*
U.S. Cl. 81—185.1 5 Claims



1. A jaw assembly for gripping tubular members, comprising:

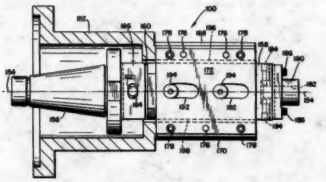
(a) a jaw member, attachable to a gripping mechanism, said jaw member having a concave surface which is provided with a plurality of parallel cog-shaped splines radially spaced over said concave surface, forming parallel cog-shaped grooves between said splines, each said spline extending outward substantially perpendicular from said concave surface.

4,576,068

CAM-CONTROLLED BORING BAR

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 3, 1984, Ser. No. 576,646
Int. Cl.[4] B23B *29/034, 3/26*
U.S. Cl. 82—1.4 **20 Claims**



1. Boring apparatus for generating a bore within a workpiece, comprising:

a first housing including means for attachment of said first housing to a first means for rotating said first housing about a predetermined axis;

a second housing, disposed within said first housing and having a cutting tool mounted thereon, including means for attachment of said second housing to a second means for rotating said second housing about, and translating said second housing in an axial direction;

means defined between said first and second housings supporting said second housing for axial and transverse movement; and

means defined between said first and second housings controlling the transverse movement of said second housing and said cutting tool relative to said predetermined axis and said first housing in response to said axial movement of said second housing so as to generate a bore within said workpiece having a predetermined configuration as determined by said controlling means.

4,576,069

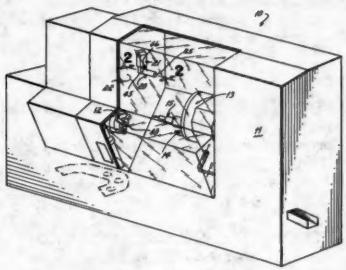
TURRET LATHE HAVING PROBE AND PROTECTIVE COVER

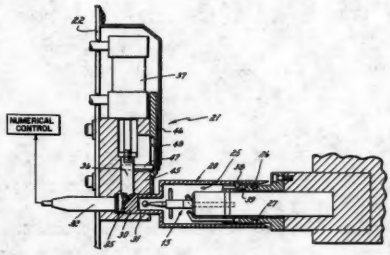
Johannes Bazuin, Cincinnati, Ohio, assignor to LeBlond Makino Machine Tool Co., Cincinnati, Ohio

Filed Feb. 2, 1984, Ser. No. 576,320
Int. Cl.[4] B23B *25/06*
U.S. Cl. 82—2 R **6 Claims**

1. In a lathe having a housing, a chuck for holding a workpiece, said chuck being mounted at one side of said housing, a tool-holding turret opposite said chuck, said turret having a plurality of tool-holding positions, and a probe mounted in one of those positions, means for rotating said turret to bring the proper tool into position and means for moving said turret longitudinally and transversely to bring tools into engagement with said workpiece, the improvement comprising:

a probe cover separable from the probe and covering the probe when said probe is not in use, and means for removing said cover from said probe automatically and retaining





said probe cover on said one side of said lathe housing when said probe is to be used.

4,576,070

PIPE CUTTER AND METHOD

Fitz E. Fitzgerald, 3274 NW. 93rd St., Miami, Fla. 33147

Continuation-in-part of Ser. No. 972,529, Dec. 22, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 169,522
Int. Cl.[4] B23D *21/14*
U.S. Cl. 82—82 **21 Claims**

1. A pipe cutter, comprising, in combination,

an elongate shaft,

a guidance member centrally and rotatably secured to one end of said shaft,

a disc-shaped cutting blade mounted on said shaft so that the longitudinal axis of the shaft is perpendicular to the plane of the cutting blade and passes through the center of the cutting blade,

power tool means for imparting a rotational torque to said shaft at the end of the shaft remote from the guidance member,

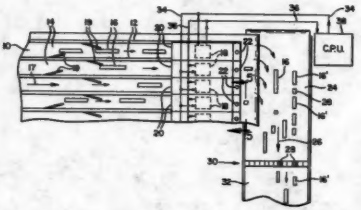
whereby the power tool causes said shaft and cutting blade to rotate about the longitudinal axis of the shaft while the cutting blade cuts a pipe as constrained by the guidance member against the inner walls of the pipe when the longitudinal axis of the shaft is constrained to precess about the longitudinal axis of the pipe in an orbital motion.

4,576,071

FOOD PRODUCT DEFECT SENSOR AND TRIMMER APPARATUS

Arthur G. Rayment, Santa Clara, Calif., assignor to Lamb-Weston, Inc., Portland, Oreg.

Filed Aug. 4, 1983, Ser. No. 520,244
Int. Cl.[4] B26D *5/34*
U.S. Cl. 83—71 **10 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 79 Pages)



1. Elongated food product defect removal apparatus, comprising:

conveyor means for conveying elongated food product strips longitudinally through separate channels;

sensor means for sensing said food product strips as they are conveyed through said channels by directing radiation of at least two different frequency bands at said strips, including first detector means for detecting a first radiation frequency band which senses the opposite ends of each strip and certain defects in said strip to produce a first output signal, and a second detector means for detecting a second radiation frequency band which senses the opposite ends of said strip but does not sense said defects to produce a second output signal;

electrical circuit means for comparing said first and second output signals to determine the presence of a defect, determine the location of said defect on the strip and produce corresponding defect removal cutting signals; and

cutter means for cutting said strips to remove any of said defects in said strips in response to receipt of said cutting signal.

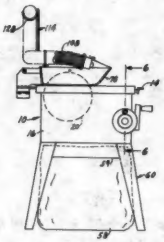
4,576,072

SAWDUST COLLECTION APPARATUS FOR A TABLE SAW

Daniel A. Terpstra, Kirkwood, and Richard B. Brundage, Ladue, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 312,002, Oct. 16, 1981, abandoned. This application May 14, 1984, Ser. No. 581,331
Int. Cl.[4] B27G *19/02, 19/08*
U.S. Cl. 83—102.1 **4 Claims**

1. In a table saw having a horizontal worktable with front and rear sides, a circular saw blade mounted below the worktable and having a peripheral portion thereof extending above the worktable rotating toward the front side of said worktable and a spreader having a portion extending above the rear side of the worktable; the improvement which comprises the provision and hinged attachment to said spreader portion of an elongated saw blade guard and table top sawdust collector having rear and forward ends and extending between said rear and front sides of said worktable and normally resting on said worktable and shrouding said peripheral saw blade portion, said hinged attachment including an arm pivotally connected at one end to said guard intermediately of its length and pivotally connected at its other end to said spreader portion whereby the forward end of said guard or said entire guard may be elevated above said worktable, said guard comprising a pair of vertical sidewalls having upper and lower horizontal edges and extending the length of said guard, an inclined forward end wall and a horizontal top wall connecting said upper sidewall edge and extending from the rear end of said guard to a forward end spaced rearward from said forward end wall, a



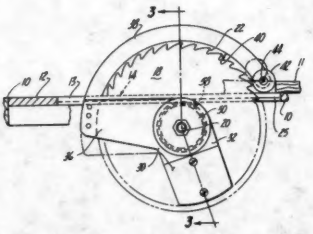
pair of sidewall portions extending upward from the upper edges of said sidewalls and extending longitudinally from said forward end of said top wall to said forward end wall, and a top wall portion connecting the longitudinally extending upper edges of said sidewall portions whereby said top wall, said sidewall portions and said top wall portion defines a rearward facing opening, and a length of flexible hose having one end connected via a hose connected to a wall defining said opening and said hose having an adjoining end portion extending rearward and resting on and attached to said horizontal top wall.

4,576,073

SAW BLADE GUARD

Robert J. Stinson, 2055 Lathers Ave., Garden City, Mich. 48135

Filed Jul. 1, 1983, Ser. No. 509,918
Int. Cl.[4] B27B *5/29*
U.S. Cl. 83—102.1 **16 Claims**



1. For use with a saw of the type including a circular cutting blade mounted for rotation with a motor driven arbor and a flat workpiece support surface having an opening therein through which a portion of the blade extends, a guard for the blade comprising:

a blade guard arm having a thickness no greater than the thickness of the blade whereby said arm may pass through a cut in a workpiece made by the blade, said arm extending through the support surface opening rearwardly of the blade and extending therefrom in curvilinear fashion over the blade to dispose the free leading end of said arm adjacent the support surface at the front of the blade so as to protectively cover the entire cutting edge of the blade portion;

means for mounting said arm on the saw for yieldable piv-

otal movement relative to said support surface about the rotational axis of the blade in response to engagement of said leading end thereof with a workpiece so as to expose a section of the blade portion to the leading edge of the approaching workpiece and allow cutting of the workpiece by the blade; and

means biasing said arm for pivotal movement about said blade axis in the direction of blade rotation so as to maintain said leading end of said arm adjacent the support surface at the front of the blade and maintain said arm in protectively covering relation to the entire cutting edge of the blade portion subject to selective and limited yieldable displacement by the leading edge of the approaching workpiece;

said mounting means including a first member mounted on said arbor for rotation with said arbor and a second member rotatably mounted on said first member whereby to rotate independently of the rotation of said arbor, said second member including a portion extending radially outward from said first member, said arm being secured to the outer extremity of said radially extending portion.

4,576,074

APPARATUS FOR SLICING BREAD PRODUCTS

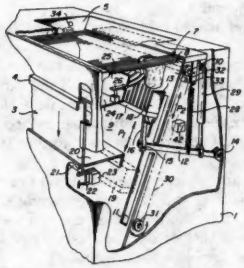
Jacobus C. Van der Togt, Voorburg, Netherlands, assignor to B.V. Haagse Bakkerijmachinefabriek, Netherlands

Filed Aug. 9, 1983, Ser. No. 521,561

Claims priority, application Netherlands, Aug. 9, 1982, 8203143

Int. Cl.⁴ B26D *5/00*

U.S. Cl. 83—358 **4 Claims**



1. An apparatus for slicing breadproducts or the like, comprising a substantially horizontal oscillated driven cutting frame having parallel cutting strips, a support surface for said product to be cut leading to said cutting frame, a member for propelling said product movable across said surface said propelling member being loaded by means of a resilient force towards said frame opposite to action of a damping member, said propelling means being further adapted to be reset, opposite to a spring action, by a reset motor controlled by a detecting means positioned above said cutting frame.

4,576,075

CIRCULAR SAW MACHINE

Kurt Holder, Koengen, Fed. Rep. of Germany, assignor to Chr. Eisele Maschinenfabrik GmbH & Co. KG, Koengen, Fed. Rep. of Germany

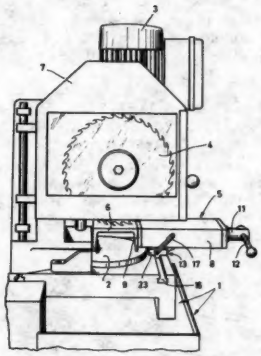
Filed Feb. 8, 1984, Ser. No. 577,953

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306743

Int. Cl.⁴ B26D *7/02*

U.S. Cl. 83—464 **2 Claims**

1. A circular saw machine comprising a frame, a workpiece support mounted on said frame; a rotatable saw mounted adjacent to said workpiece support; a shaped groove formed in said frame; workpiece clamping means having a lower support portion slidably mounted in, and interfitting with said shaped groove whereby said clamping means is slidably keyed to said frame; means for locking the clamping means support portion in a desired, fixed position along the length of said shaped groove comprising a rotatable shaft having its longitudinal axis extending over and in substantially parallel relation with said groove; said workpiece clamping means also having a bore; said shaft having a first portion rotatably mounted in said bore; a slot formed in the workpiece clamping means portion defining said bore; means engaging said shaft first portion and disposed in said slot for preventing axial movement of said shaft in both directions relative to said workpiece clamping means; a second portion of said shaft being formed so as to define an eccentric cylindrical surface of smaller diameter than the diameter of said shaft first portion and which rotates eccentrically relative to the shaft central longitudinal axis; said clamping means lower support portion being connected to the eccentric surface of said shaft whereby rotation of said shaft locks said support portion relative to the portion of said shaped groove in which disposed.



4,576,076

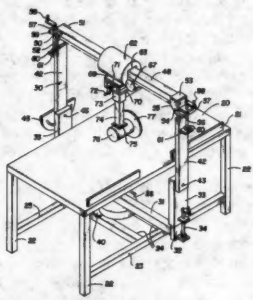
MULTIPLE INTERSECTING PLANES CUTTING DEVICE

Stoddard H. Pyle, Corvallis, Oreg., assignor to Speed Cut, Inc., Corvallis, Oreg.

Filed Oct. 16, 1984, Ser. No. 661,392

Int. Cl.⁴ B27B *5/20*

U.S. Cl. 83—471.3 **18 Claims**



1. A machine for making diverse cuts in workpieces comprising a table having a horizontal workpiece support surface and a workpiece fence, a powered rotary workpiece cutter

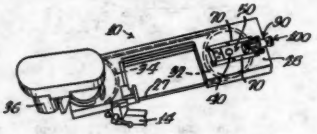
above said support surface, carriage means for said cutter, means carrying the carriage means and cutter along a first horizontal path of movement parallel to the workpiece support surface, means to move the cutter on the carriage means on a second horizontal path of movement parallel to the workpiece support surface and perpendicular to said first horizontal path of movement, means connected with said table and with said carrying means for swinging said carrying means on an arcuate path around a horizontal axis lying in a plane defined by the workpiece support surface in opposite directions to adjust the angle of inclination of said rotary cutter with respect to the vertical and to lock the cutter in a chosen inclined position relative to said workpiece support surface, means to rotate said cutter around an axis perpendicular to said workpiece support surface, and means connected with said cutter and said carriage means to reciprocate the cutter on the last-named axis.

4,576,077

SPRING-BIASED TENSIONING DEVICE FOR A BAND SAW BLADE

Timothy C. Titus, Three Rivers, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed Sep. 4, 1984, Ser. No. 647,142
Int. Cl.[4] B23D *55/06, 55/10*
U.S. Cl. 83—816 **17 Claims**



1. In a band saw having a frame, spaced-apart band wheels rotatably mounted to said frame in a common plane of rotation and adapted to receive and carry an endless band saw blade thereon, a blade drive means operably associated with one of said band wheels to drive said one band wheel in rotation, and another of said band wheels being an idler wheel and additionally being mounted for movement in said plane of rotation relative to said driven band wheel to tension said endless band saw blade, an improved blade tensioning mechanism which comprises:

a block slidably mounted on said frame and carrying said idler band wheel rotatably mounted thereon, said block defining an internally threaded bore;

a housing carried in fixed relationship on said frame, said housing defining first, second, and third bores coaxially aligned with said block bore, said second bore communicating at one end with said first bore and at the other end with said third bore, said third bore having a larger diameter than said second bore to define an annular shoulder around said second bore, said housing defining an internal thread in said first bore;

an externally threaded link having one end extending into said block bore and threadingly engaged therein with said block, said link extending through said first, second, and third bores of said housing with the other end of said link being disposed adjacent said third bore, said link including a drive pin projecting radially outwardly within said housing;

a handle connected to said other end of said link for rotating said link;

a thrust bearing disposed on said link in said housing third bore for rotation relative to said link and for being driven by said link toward said housing annular shoulder, said thrust bearing having on one end at least a first bearing surface facing toward said housing shoulder;

an adjustable retainer and stop member threadingly engaged with said housing first bore thread, said retainer and stop member defining first and second bores coaxially aligned with said link, said retainer and stop member being disposed with said member first bore closer to said block bore than said member second bore and with said member second bore concentrically oriented within said housing first bore, said member second bore having a larger diameter than said member first bore to define an annular retaining surface around said member first bore, said retainer and stop member also defining a generally annular abutment surface around said member second bore within said housing first bore;

a collar disposed on said link to accommodate axial movement within said housing bores, said collar having a generally hollow configuration with an externally threaded cylindrical periphery for engaging said internal thread in said housing first bore, said collar having oppositely facing first and second annular end surfaces, said collar first end surface being adapted to abut said member abutment surface, said collar second end surface being adapted to bear directly or indirectly against said first bearing surface of said thrust bearing, said collar defining a channel oriented longitudinally of the collar length and opening inwardly to the hollow interior of said collar for receiving said projecting drive pin of said link; and

a compression spring disposed around said link within said housing with one end of said spring abutting said member retaining surface and with the other end of said spring abutting said collar first end surface whereby said link can be rotated by said handle to

(1) apply an increasing initial tension on said band saw blade in response to the movement of said block along said link toward said handle until said collar overcomes the bias of said spring and engages said housing first bore threads,

(2) further thread said collar into said housing first bore against said spring and to thread said link further into said block bore to carry said thrust bearing toward said housing annular shoulder until the axial movement of said rotating link relative to said frame and housing annular shoulder is terminated by the engagement of said thrust bearing with said housing annular shoulder, and

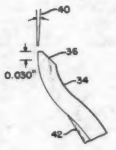
(3) subsequently apply an increasing final tension on said saw blade as said block moves along said rotating link toward said handle until said collar abuts said annular abutment surface on said retainer and stop member to prevent further rotation of said link.

4,576,078

REINFORCED SAW CHAIN TOOTH

Gerald C. Kolve, 5833 SW. Lane Ct., Portland, Oreg. 97221

Continuation-in-part of Ser. No. 503,334, Jun. 10, 1983. This application Apr. 13, 1984, Ser. No. 599,769
Int. Cl.[4] B27B *33/14*
U.S. Cl. 83—833 **11 Claims**



1. A chain saw side cutter tooth comprising:

(a) a link having

(i) a body defining a plane for the tooth and two half-spaces separated by the plane;

(ii) a root, extending from the body in the plane, capable of engaging a sprocket of the chain saw;

(iii) a leading depth gauge extending laterally outwardly

from the body in a direction substantially opposite the root but in the plane;

(iv) a trailing cutter element extending laterally outwardly from the body in a direction substantially opposite the root, yet spaced behind the depth gauge, ending in a cutter tip, the element curling out of the plane into one half-space, the tip extending upwardly substantially vertically and substantially parallel to the plane of the body and the tip sloping back inwardly toward the plane of the body; and

(b) a second link, being substantially a mirror image of the first link, positioned adjacent the first link in substantial alignment with the first link to form a side cutter tooth capable of simultaneously cutting slits on both sides of a kerf when moving as part of the saw chain.

4,576,079

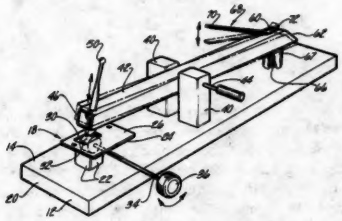
GLASS SCRIBER ASSEMBLY

Pat Donofrio, 1725 Westfield, Trenton, Mich. 48183

Filed Dec. 3, 1984, Ser. No. 677,689

Int. Cl.[4] C03B *33/02*

U.S. Cl. 83—886 **10 Claims**



1. A glass scriber assembly comprising:

a base,

a support attached to said base, said support having a surface adapted to support a sheet of glass,

an elongated arm,

means for pivotally mounting a midpoint of said arm to said base so that one end of said arm is positioned over said support surface,

a conventional glass scriber,

means for detachably securing said glass scriber to said one end of said arm so that said glass scriber engages a sheet of glass on said support surface,

means for resiliently urging the other end of said arm away from said base,

means for moving a sheet of glass on said support surface, and

wherein said arm includes a throughbore at said one end, said throughbore being open to said surface and adapted to slidably receive said conventional glass scriber and corresponding in shape to said conventional scriber, and wherein said detachable securing means comprises a locking tube slidably mounted in said arm and adapted to flatly abut against said scriber at longitudinally spaced positions, and means for detachably securing said tube and said arm together.

4,576,080

GUITARS

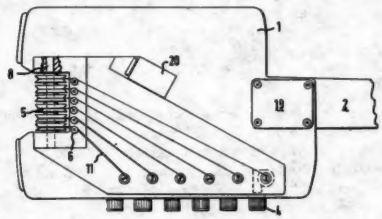
William S. McLellan, and Alan G. Marriott, both of London, United Kingdom, assignors to Marriott McLellan Limited, London, England

PCT No. PCT/GB82/00215, § 371 Date Mar. 12, 1984, § 102(e) Date Mar. 12, 1984, PCT Pub. No. WO84/00433, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 16, 1982, Ser. No. 598,343

Int. Cl.[4] G10D *1/08*

U.S. Cl. 84—267 **10 Claims**



1. A guitar comprising a head (9), a body (1), means (10) for anchoring one end of each of a plurality of strings (11) to the head (9), and a plurality of tuning machines (3) mounted on the body (1) for retaining the non-anchored end of a string (11), characterised in that each tuning machine (3) is located on the back of the body (1) and that the arrangement of the guitar is such that, when strung, the strings pass from the front to the back of the body about the bottom edge thereof.

4,576,081

CERAMIC SEALING ROPE

Jacob Felthuis, Oudorp, and Joseph H. Tournier, Rotterdam, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden and Keralox B.V., Rotterdam, both of Netherlands

Claims priority, application Netherlands, Jul. 4, 1983, 8302366

Filed Jul. 3, 1984, Ser. No. 627,670

Int. Cl.[4] D04C *1/02, 1/12*

U.S. Cl. 87—6 **7 Claims**

1. Ceramic sealing rope comprising a core and at least one sleeve surrounding said core, said core comprising a plurality of solid metal wires and ceramic yarn wrapped around each of said solid metal wires, said sleeve comprising a plurality of ceramic yarns cross-woven about said core, each of said ceramic yarns cross-woven about said core being wrapped about a solid metal wire.

6. The rope according to claim 1, wherein the number of cross-woven yarns of the sleeve amounts to one pair of two intertwined yarns.

4,576,082

LINEAR FIBER ARMATURE FOR ELECTROMAGNETIC LAUNCHERS

Samuel J. Scuro, Verona, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1982, Ser. No. 453,687

Int. Cl.[3] F41F *1/02*

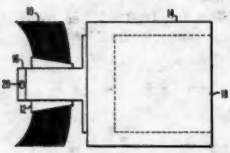
U.S. Cl. 89—8 **12 Claims**

1. An armature for conducting DC current between a pair of

electrically conductive rails while being driven along the rails under the influence of electromagnetic forces generated by the application of said DC current, said armature comprising:

an insulating support structure;

a plurality of conductive copper fibers;



a cylindrical sleeve having an opening through which said conductive fibers pass, wherein said conductive fibers are compacted to form a solid mass within said sleeve; and

means for mounting said sleeve on said support structure;

wherein said conductive fibers are spirally disposed with respect to the axis of said sleeve.

4,576,083

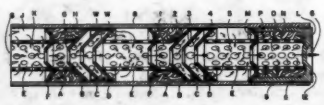
DEVICE FOR SILENCING FIREARMS

Oswald P. Seberger, Jr., P.O. Box 377, Shingletown, Calif. 96088

Filed Dec. 5, 1983, Ser. No. 558,375

Int. Cl.[4] F41C *21/18*

U.S. Cl. 89—14.4 **9 Claims**



1. A silencer for a firearm comprising:

(a) a cylindrical tube having a longitudinal axis;

(b) means for attaching said tube to a muzzle of said firearm such tat said axis is coaxially aligned with the bore of said firearm;

(c) said tube having positioned in its interior a plurality of elements disposed for guiding of expanded gases and transmitting of sound waves from the end of said muzzle towards the outside of said tube, said elements being concentrically positioned along said axis of said tube, said elements including:

(1) a first flange member positioned within the interior of said tube; said flange member having a central conical portion with an opening within the apex end of said conical portion, said apex end facing the muzzle of said firearm, said opening concentric to said central conical portion, said flange member further having a truncated cone shaped surface located on the outer diameter of said member, the wider end of said truncated cone shaped surface facing said muzzle and being concentric with said tube axis; (2) a first hollow cylindrical member having an outer diameter smaller than the inside diameter of said tube and having a plurality of radial holes through its periphery; (3) a plurality of hollow conical baffling members in the form of truncated cones with their apexes facing said muzzle of said firearm, each said conical member positioned in sequence along the axis in the interior of said tube, each of said conical members having an array of holes substantially circularly disposed around the periphery of said conical members, said conical members having their widest end extended close to the interior surface of said tube, each said array of holes being located farther from the apex of its respective conical member than the array of the previous conical member;

(4) a second hollow cylindrical member having an outside diameter of said first cylinder and less than the inside diameter of said tube and having a array of radial holes disposed around the periphery, of said cylindrical member positioned such that the ends of said cylindrical member abuts the sides of said conical member;

(d) all of said elements firmly bonded together to form a first unit, said unit being fitted into said interior of said tube.

4,576,084

SMALL ARM HAVING A BARREL WITH A TRANSVERSE BORE AND A DETACHABLE SILENCER

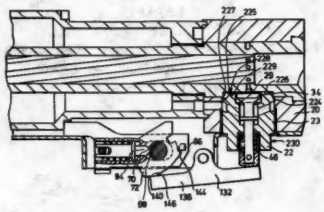
Rudolf Brandl, Dornhan-Weiden, and Helmut Danner, Sulz-Sigmarswanger, both of Fed. Rep. of Germany, assignors to Heckler & Koxh GmbH, Oberndorf/Neckar, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,080

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325623; Jul. 15, 1983, 3325671

Int. Cl.[4] F41C *21/18*

U.S. Cl. 89—14.4 **19 Claims**



1. A small arm having a barrel (11) with at least one transverse bore (14) and a detachable silencer (9, 62) including an expansion chamber (58) communicating with the transverse bore, comprising selectively operable closure means (34) arranged in the path of the combustion gases between the interior of the barrel and the expansion chamber, characterized by an arrangement in which the closure means (34) is prevented from being opened or from remaining in the open position when the silencer (9, 62) is not in place.

4,576,085

SLIP RING ASSEMBLY

Richard S. LeBlanc, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 437,854, Oct. 29, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,713

Int. Cl.[4] F41H *7/02*

U.S. Cl. 89—36.13 **2 Claims**

1. An armored vehicle comprising:

a turret assembly;

a vehicle body;

said turret assembly being supported by and rotatable relative to said vehicle body and including a cage having a cage floor;

an electrical source and a source of pressurized fluid in said vehicle body;

terminals for electrical equipment in said turret assembly;

a slip ring assembly located in the center of said cage floor for electrically connecting said terminals in said turret assembly to said electrical source in said vehicle body;

said slip ring assembly including,

a. a planar disk carried by said vehicle body and having concentric electrical conductive grooves insulated from

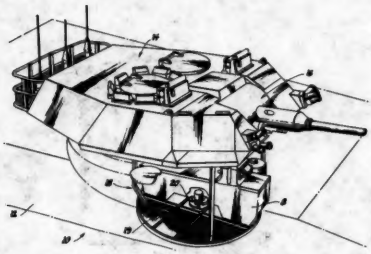
one another, at least some of said grooves being connected to said electrical source;

b. a circular platter member fixed to said turret assembly and rotatable therewith and having a depending skirt circumferentially surrounding the periphery of said planar disk;

c. bearing means between said periphery of said planar disk and said skirt of said platter member for allowing relative rotational movement therebetween;

d. said platter member having a plurality of circumferentially spaced cavities formed therein offset from the center of said platter member and in vertical alignment with said electrical conductive grooves of said planar disk;

e. plug-in type brush means removably located in said cavities of said platter member for engaging said electrical



conductive grooves, said brush means being formed of electrically conductive material and connected to said electrical equipment in said turret assembly to conduct electricity from said electrical source to said planar disk and to said electrical equipment as said brush means is rotated about the surface of said planar disk;

f. said planar disk and said platter member each having a centrally located opening formed therein;

g. a coupling located in said centrally located opening in said planar disk and said platter member for delivering pressurized fluid from said source of pressurized fluid to said turret assembly; and

h. an ammunition box for holding ammunition employed by said turret assembly and extending diametrically through the center of said cage floor over said slip ring assembly.

4,576,086

HYDROPNEUMATIC ENERGY-RECUPERATING RECOIL BRAKE FOR ARTILLERY PIECES AND FIREARMS

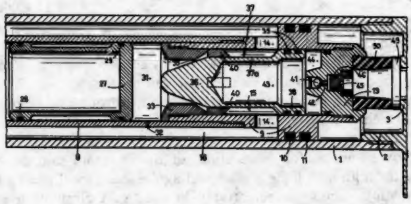
Francois Brandt, Chalet Le Caribou, 1884 Villars sur Ollon, Vaud, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,472

Claims priority, application France, Oct. 14, 1982, 82 17233

Int. Cl.⁴ F41F *19/02*

U.S. Cl. 89—43.01 **22 Claims**



1. A hydropneumatic energy-recuperating recoil brake for artillery, infantry and other weapons, comprising a cylindrical tubular body (1) connected to a fixed frame of the weapon and inside which sealingly slides a hollow rod (8) connected to the recoiling mass of the weapon, an annular space (16) between said body (1) and said rod (8) being filled with a hydraulic liquid and connecting with a first chamber (31) delimited inside said rod (8) by a movable energyrecuperating piston means (27) which also delimits a second chamber (30) filled with a gas, a flowregulating valve (37) having a body movably mounted inside said hollow rod and acted on elastically in a closing direction, said valve cooperating with a seat (33) fixed to said rod and so defining a passageway having a cross-section which varies during the recoil movement of said rod inside said body, wherein said valve body is located upstream of the liquid flow with respect to said valve seat (33), with the valve (37) moving in the opposite direction to said flow in order to open the above-mentioned passage during recoil of said rod (8).

4,576,087

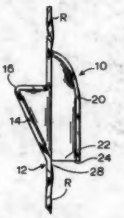
AIR VENT FOR AN ARTICLE

Henry S. Wolfe, St. Petersberg, Fla., assignor to Swell-Wear, Inc., New York, N.Y.

Filed Jan. 8, 1985, Ser. No. 689,646

Int. Cl.⁴ A41D *3/04*

U.S. Cl. 98—1 **7 Claims**



1. An air vent for an article adapted to cover a device wherein said article has at least a planar surface having an aperture; said air vent comprising:

a planar member having a rearwardly extending projection adapted to engage the device to space the aperture therefrom to permit the flow of air therethrough;

a through opening in said member spaced above said projection;

a forwardly projecting cover on the other side of said member covering said opening to prevent the entry of rain therethrough, said cover extending outwardly from a point above said opening and downwardly therefrom to a point spaced below said opening, said cover having a skirt portion which is spaced from said member to define a bottom opening therebetween;

and a peripheral flange on said member adapted to engage the edges of said article adjacent said aperture to position said air vent in said aperture.

4,576,088

PRESSURE-WAVE PROTECTIVE FLAP (OR DAMPER)

Wolfgang Mathewes, Giessen; Klaus Fitzner, Betzdorf, and Uwe Plitt, Kirchen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

PCT No. PCT/DE83/00061, § 371 Date Nov. 21, 1983, § 102(e) Date Nov. 21, 1983, PCT Pub. No. WO83/03462, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 29, 1983, Ser. No. 558,032

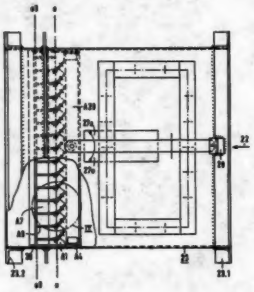
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1982, 8208932[U]

Int. Cl.⁴ F23L *17/00*

U.S. Cl. 98—119 **33 Claims**

1. Shutter for protecting against pressure wave devices through which a gaseous or vaporous medium flows, the shutter having a frame structure and being formed of a multiplicity of slats pivotable about parallel axes in a common plane, the

slats being maintained by restoring forces in an open position thereof and being braced against stops on the frame structure, the slats individually being formed of substantially planar strips, respectively, with opposite pairs of relatively long and short edges, the respective axes of the slats extending in direction and in vicinity of one of the relatively long edges thereof, and a supporting device disposed downstream of the slats in pressure surge direction of the medium and secured to the frame structure, the supporting device being formed of support elements disposed in a support raster and having a mutual division spacing matched to the width of the strips, the support elements having support locations thereon with which the slats are in engagement in a closed position thereof, the slats, in the open position thereof, being inclined away from the supporting device so that the free relatively long edges thereof are in engagement with the stops on the frame structure, the shutter further comprising a support grid forming the supporting device and covering the multiplicity of slats, said support grid



including at least two groups of the support elements which are formed as grid bars, said groups of grid bars both extending in different directions, the grid bars of each of said two groups extending parallel to one another and having a plurality of the support locations thereon distributed over the entire length thereof, respectively, and engaged by the respective slats in the closed position thereof, and respective pretensioned leaf springs for generating torque about the respective pivot axes of the slats and applying restoring forces to the slats, on respective sides thereof facing towards said support grid, and in vicinity of the respective free, relatively long edges thereof, said leaf springs having, at one end thereof, a respective first force engagement point with the respective slats and, at the other end thereof, a respective second force engagement at a grid bar adjacent thereto, said leaf springs being fastened at one of said first and second force engagement points, and having a sliding seat at the other of said first and second force sliding seat at the other of said first and second force engagement points.

4,576,089

AUTOMATIC ROUX MAKER

John A. Chauvin, 921 Solon, Gretna, La. 70054

Division of Ser. No. 422,570, Sep. 24, 1982, Pat. No. 4,492,713. This application Nov. 1, 1984, Ser. No. 667,321

Int. Cl.[4] A47J *27/62*

U.S. Cl. 99—332 **5 Claims**

1. An automatic cooker system for preparing a roux or the like, comprising:

a cooking pot having a bottom and cylindrically shaped side walls;

heat source means for heating and cooking fluid contents of said pot;

agitator means associated with the pot for mixing and moving the fluid contents of said pot, said agitator means including

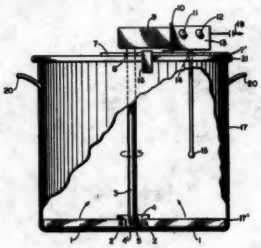
a centrally located rotor shaft extending down to a position in juxtaposition to the pot bottom;

at least one paddle arm located at the bottom of said rotor shaft and extending radially out from said shaft with its bottom edge in sweeping contact with the upper surface of the pot bottom;

a floating connector connecting said paddle arm to said rotor shaft by means of a connection which allows said paddle arm to move up and down and to pivot in the axial plane with respect to said rotor shaft; and

a powered motor attached to said rotor shaft for rotatively driving it to move said paddle arms in sweeping contact across the bottom of said pot; and

controller system means associated with said agitator means



and said heat source for controlling the amount and duration of heating energy supplied to said heat source for said pot and for automatically controlling the power to said motor, said controller system including

temperature sensing means for sensing the temperature of the contents of pot;

controller circuitry means associated with said temperature sensing means for controlling the heat level and duration of heating of said heat source to the pot until the desired set degree of color level of the roux is reached; and

motor control circuitry means associated with said motor for maintaining the motor in operation while the roux is being cooked and for a significant period of time thereafter while the cooked roux is cooking down until a safe, lowered temperature is reached.

4,576,090

TUNNEL HEATER

Constantin Burtea, Melrose Park, Ill., assignor to Mastermatic, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 379,738, May 19, 1982, Pat. No. 4,471,750. This application May 2, 1984, Ser. No. 606,138 The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] A23L *3/00*; A21B *1/00*

U.S. Cl. 99—443 C **11 Claims**

1. An apparatus for heating food products by convection, comprising:

a housing having a tunnel-like cavity adapted to receive said food products and an inlet and outlet thereto;

means for conveying said food products through said cavity;

foraminous plate means disposed above and below said cavity;

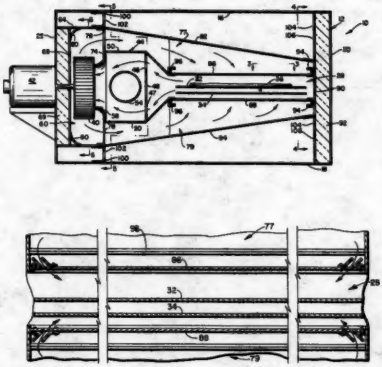
blower means for circulating air drawn from said cavity through said plate means and against said food products;

heating means for selectively heating said circulating air;

and aerodynamically efficient duct means for guiding air flow from said blower means to said plate means, said duct means defining scroll-shaped passage means associated with said blower means, and venturi means disposed downstream of said passage means and upstream of said plate means for creating a relative increase in the pressure

of the circulated air before passage through said plate means for heating said food products;

said scross-shaped passage means comprising a pair of scroll-shaped passages associated with said blower means arranged to respectively duct circulated air above and



below said cavity for passage through said plate means, and

air curtain means associated with said blower means and heating means for directing a curtain of heated air across the inlet and outlet to said cavity.

4,576,091

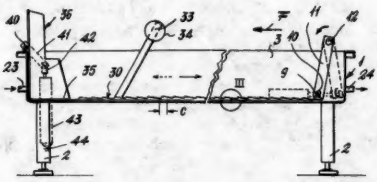
APPARATUS FOR CHEESE COMPACTING

Gabriele Muzzarelli, Via Marzabotto, 116-41100 Modena, Italy

Filed Jul. 30, 1984, Ser. No. 636,024

Int. Cl.[4] A23C *19/00*

U.S. Cl. 99—455 **11 Claims**



1. Apparatus for compacting whole cheese by contact with water, comprising

a container having cheese inlet and outlet ends,

conveyor means situated in said container for receiving and conveying the cheese from said inlet to said outlet end,

said conveyor means being mounted for reciprocating movement in first and second directions towards and away from said outlet end respectively,

inertial means associated with said conveyor means for moving the cheese in said first direction when said conveyor means are moving in said first direction, and for maintaining the cheese substantially in position under its own inertia when said conveyor means are moving in said second direction,

said inertial means comprising means for moving said conveyor means in said first direction at a speed lower than the speed of said conveyor means in said second direction, whereby the cheese moves in the direction of the slower speed and is substantially retained in position by its own inertia during the reverse movement of said conveyor means at the faster speed, and

a bascule element disposed at an end of said conveyor means and adapted to receive the cheese moved therealong and to remove same from said container by rotating about an axis.

4,576,092

UNIFORM-PRESSURE PRESS APPARATUS

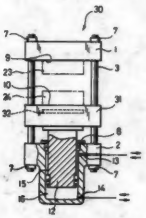
Yoshiharu Yamato, Numazu, Japan, assignor to Kohtaki & Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,516

Claims priority, application Japan, Aug. 22, 1983, 58-151697

Int. Cl.[4] B30B *15/32*

U.S. Cl. 100—218 **13 Claims**



1. A uniform-pressure press apparatus comprising:

a pressure-receiving frame provided with a first operation surface having an upper die mounted thereon;

a movable table provided with a second operation surface having a lower die mounted thereon;

a plurality of liquid-containing, pressure equalizing chambers independently formed in at least one of said pressure-receiving frame and said movable table and arranged in a planar array thereacross, said pressure equalizing chambers occupying an area corresponding to that of the operation surface for mounting either of said upper and lower dies, so that said operation surface is supported through said pressure equalizing chambers; and

passage means for communicating said chambers with each other.

4,576,093

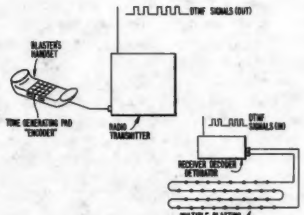
REMOTE RADIO BLASTING

Richard N. Snyder, P.O. Box 295, Lorton, Va. 22079

Filed Apr. 12, 1984, Ser. No. 599,690

Int. Cl.[4] F42D *1/00*

U.S. Cl. 102—200 **7 Claims**



1. A remote control detonation system comprising a radio transmitter operable to transmit a radio signal on a carrier, encoder means at said transmitter operable to generate encoded signals in sequence, means at said transmitter responsive to said coded signals to modulate said carrier in accordance

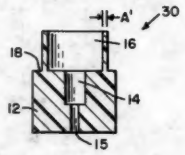
with said encoded signals, a radio receiver operable to receive the carrier signal transmitted by said transmitter, a detonating circuit operable when activated to detonate an explosive, and decoding means connected to said receiver responsive to a predetermined sequence of encoded signals received by said receiver to activate said detonating circuit only when said predetermined sequence of encoded signals have been received by said receiver.

4,576,094

FABRICATION OF EXPANDABLE POLYSTYRENE PLASTIC IGNITION CONTAINERS

Jacqueline C. Meador, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1985, Ser. No. 770,050
Int. Cl.[4] F42B 3/10
U.S. Cl. 102—202.12 4 Claims



1. A method for fabrication of an expandable polystyrene plastic ignition container, said container having the weight, density, and strength requirements to function in a high length to diameter rocket flight motor and to remain intact until all parts of a contained ignitor charge is ignited and which said expandable polystyrene plastic ignition container subsequently breaks up into small pieces to that plugging of the nozzle of said rocket flight motor does not occur, said method comprising completing the method steps set forth under parts A, B, and C stages as follows:

Part A, pre-expanding stage consisting of:

(i) selecting a first predetermined quantity of a heat expandable polystyrene in the form of minute unexpanded beads;

(ii) placing said predetermined quantity of heat expandable beads in boiling water;

(iii) expanding said beads to approximately three times their original size;

(iv) draining off excess water;

Part B, blending stage consisting of:

(i) selecting a second predetermined quantity of a heat expandable polystyrene in the form of minute beads;

(ii) combining said first predetermined quantity of a heat expandable polystyrene in said pre-expanded form with said second predetermined quantity of a heat expandable polystyrene and mixing thoroughly to yield a twinned polystyrene beads blend consisting of about 4.5 parts by weight of said pre-expanded polystyrene beads and of about 10 parts by weight of said heat expandable polystyrene in the form of minute beads; and,

Part C, molding and heat forming stage consisting of:

(i) adding a predetermined quantity of said blend of twinned polystyrene beads into a casting mold of a predetermined shape for said ignitor casting container component;

(ii) placing said mold containing said twinned polystyrene beads into a steam chamber;

(iii) admitting steam to said steam chamber to pressurize to 250° F. with 15 psig steam;

(iv) retaining said mold containing said twinned polystyrene beads under said pressurized steam for about three miutes;

(v) removing said mold from said steam chamber;

(vi) placing said mold containing said twinned polystyrene beads in an expanded stage into cold water for about one minute; and

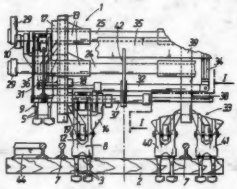
(vii) removing polystyrene plastic ignitor casing container from said mold.

4,576,095

BALLAST TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Sep. 10, 1984, Ser. No. 648,715
Claims priority, application Austria, Nov. 2, 1983, 3874/83
Int. Cl.[4] E01B 27/16
U.S. Cl. 104—12 8 Claims



1. A machine for tamping ballast under a respective one of a succession of ties of a railroad track comprised of two rails fastened to the ties at points of intersection therebetween, each track rail having a field side and a gage side, the tamping machine comprising a machine frame movable along, and extending in the direction of, the track and having guide means extending transversely to the machine frame and track, and a tamping tool unit comprising

(a) a frame associated with one of the rails and mounted for transverse displacement on the guide means, the frame having two pairs of vertical guide columns disposed in a common vertical plane defined by the associated rail,

(b) power drive means for transversely displacing the frame on the guide means,

(c) a respective tamping tool carrier mounted on each pair of vertical guide columns for vertical adjustment with respect to the frame,

(d) a respective drive for vertically adjusting each one of the tamping tool carriers independently on the pair of vertical guide columns whereon the respective tamping tool carrier is mounted,

(e) a respective pair of tamping tools mounted on each one of the tamping tool carriers for immersion at the field side and the gage side, respectively, of the associated rail at a respective one of the points of intersection,

(f) hydraulic drive means for independently reciprocating each one of the tamping tools of each one of the pairs of tamping tools, and

(g) a respective drive means for vibrating the tamping tools of each pair of tamping tools.

4,576,096

WHEELED LOCKING CARRIER

Ellis I. Toder, 431 Militia Hill Rd., Fort Washington, Pa. 19034

Filed Aug. 13, 1984, Ser. No. 639,695
Int. Cl.[4] B61H 7/04; B61B 3/00
U.S. Cl. 104—94 16 Claims

1. A locking wheeled carrier for use in conjunction with a suspended hollow track, said track being of the type having a top, sides and a pair of bottom walls turned inward toward one another from the bottoms of the sides and terminating in parallel spaced apart slot defining sidewalls which define a continuous longitudinally extending slot, said carrier comprising in combination,

(a) a wheeled carriage in which the wheels are seatable upon the track bottom walls for movement of the carriage through the track,

(b) a pair of spaced apart locking blocks carried by said

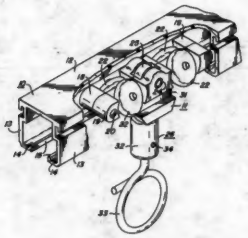
carriage and extending downward between the track slot defining sidewalls, said locking blocks

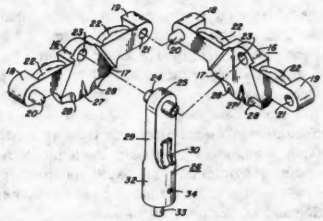
(1) being free to move within limits toward and away from one another widthwise of the track,

(2) carrying camming elements, and

(3) having locking surfaces facing the track slot defining sidewalls, and

(c) a shiftable carrier element depending from said wheeled carriage, said carrier element carrying camming elements adapted to coact with the said camming elements of said





locking blocks so that movement of said carrier element in a first way relatively to said locking blocks causes said coacting camming elements to engage and move said locking blocks into engagement with the track slot defining sidewalls to thereby lock the carriage in the track, and movement of said carrier element in a second way relatively to said locking blocks causes said coacting camming elements to disengage sufficiently to release said locking blocks from engagement with the track slot defining sidewalls to thereby release the carriage for movement in the track.

4,576,097

PIPELINE INSPECTION VEHICLES

John L. Foster, 49 Oakland Rd., Monkseaton, Tyne & Wear, England

Continuation of Ser. No. 276,889, Jun. 24, 1981, abandoned. This application Nov. 2, 1984, Ser. No. 667,392

Claims priority, application United Kingdom, Apr. 27, 1981, 8112915

Int. Cl.[4] B61B *13/10*; B65G *51/00*

U.S. Cl. 104—138 G **6 Claims**

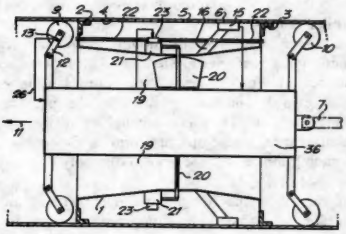
1. A pipeline inspection vehicle which is propelled along the pipeline by pressure produced by fluid flowing along the pipeline and which comprises:

(a) a vehicle body;

(b) at least one resilient driving cup mounted around said vehicle body so as to contact the interior wall of the pipeline and thus provide a fluid pressure differential across the driving cup which will propel the vehicle along the pipeline;

(c) an annular array of ducts disposed around the periphery of said vehicle body and extending through said vehicle body to by-pass fluid through said driving cup;

(d) a butterfly valve in each said duct for regulating the flow of fluid through said duct; and



(e) a means operatively connected to said butterfly valves to open and close said butterfly valves in a manner so as to maintain a steady speed of said vehicle body in the pipeline which speed is less than that of the fluid flow in the pipeline.

4,576,098

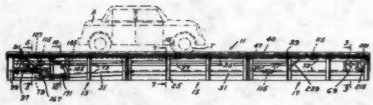
AUTOMOBILE CONVEYOR

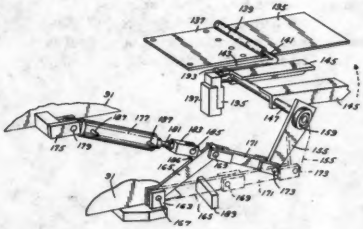
James A. Belanger, Northville; Robert Wentworth, Ann Arbor, and James M. Lapham, Northville, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed May 26, 1983, Ser. No. 498,254

Int. Cl.[4] B61B *10/00*; B65G *17/24*

U.S. Cl. 104—172 B **19 Claims**





1. In an automobile conveyor having an elongated framework including a pair of spaced top plates for supporting the tire of an automobile movable thereover, an endless sprocket chain having upper and lower runs movably positioned within said framework below said top plates and extending around drive and driven sprockets within and adjacent opposite ends of said framework, and a plurality of roller dollies within said framework spaced along the length of, connected to and projecting outwardly of said sprocket chain;

the improvement comprising a pair of bottom plates spaced below and extending in the same direction as said top plates;

the roller dollies connected to said lower run being movably supported upon said bottom plates;

a plurality of parallel spaced transverse rollers journaled

upon said framework intermediate said top and bottom plates;

said upper run of said sprocket chain being movably supported upon said rollers;

there being an aperture in said top plates adjacent one end of said framework adapted to selectively receive one of the roller dollies;

an elevator ramp pivotally mounted upon said framework, underlying said aperture below said top plates and having a horizontal clearance position below said upper run and an upwardly inclined position in the path of forward movement of the selected roller dolly for guiding said dolly through said aperture onto said top plates for advancing movement thereon to operably engage the automobile tire;

said elevator ramp being secured to a ramp mount shaft rotatably journaled and supported upon said frame,

a crank member connected at one end to said ramp mount shaft and connected at the opposite end to a first linkage such that said crank member rotates said ramp mount shaft upon movement of said first linkage;

said first linkage having an opposite end pivotally connected to a second linkage pivotally mounted to said frame, said first and second linkages forming a mechanical lock at said pivotal connection to lock said elevator ramp in said upwardly inclined position;

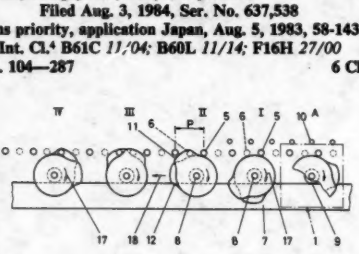
and power operated means connected to said second linkage and effective when energized to rotate said ramp to its upwardly inclined position.

4,576,099

PALLET TRANSPORT APPARATUS

Hiroshi Makino, No. 1013, Haguro-cho, Koufu, Yamanashi, Japan 400, and Shigeyuki Shinohara, 9-7-303, Shimouma 6-chome, Setagaya-ku, Tokyo, Japan 154

Filed Aug. 3, 1984, Ser. No. 637,538
Claims priority, application Japan, Aug. 5, 1983, 58-143393
Int. Cl.[4] B61C *11/04;* B60L *11/14;* F16H *27/00*
U.S. Cl. 104—287 **6 Claims**



1. A cam-controlled pallet transport apparatus which comprises:

individual box-type pallets each containing in-line indexing cam means consisting of one upper plate cam and one lower plate cam and a drive motor for driving said in-line indexing cam means; and

a pallet running way on which said pallets travel, including cam follower pairs each arranged at equally spaced intervals along said pallet running way, whereby said in-line indexing cam means and corresponding cam followers facing said cam means control the pallet so that it can travel and be stopped every one pitch as determined by the intervals between the cam follower pairs.

4,576,100

CRANE FOR NUCLEAR WASTE HANDLING FACILITIES

Michael A. Zanin, Cuyahoga Falls, Ohio, assignor to AMCA International Corporation, Hanover, N.H.

Filed Sep. 17, 1982, Ser. No. 419,168
Int. Cl.[4] G21C *19/32;* B61D *15/00;* B66C *17/06*
U.S. Cl. 105—49 **20 Claims**

1. A crane for use in a nuclear waste handling facility comprising:

a bridge of sufficient transverse dimension to span the width of the area being serviced by said crane;

means for moving said bridge along spaced rails extending longitudinally along opposite sides of said area being serviced; and

crane control means including a control cabinet depending from cantilever means extending from said bridge;

said facility including stationary radiation barrier means extending longitudinally in spaced relationship to one of said rails, said barrier means being positioned between said bridge and said crane control means;

said barrier means including wall means with a horizontally elongated opening, said cantilever means extending from said bridge through said opening in said wall means, said wall means being positioned between said bridge and said control cabinet, the side of said wall means on which said control cabinet is positioned being adapted for operating at a positive pressure relative to the pressure of the side of said wall means on which said bridge is positioned;

said means for moving said bridge including:

main wheels comprising first and second primary wheel means, first and second secondary wheels means and first and second tertiary wheel means;

primary drive means including: a first primary drive comprising first primary wound rotor motor means and adapted for driving said first primary wheel means along one of said spaced rails; and a second primary drive comprising second primary wound rotor motor means and adapted for driving said second primary wheel means along the other of said spaced rails;

secondary drive means including: a first secondary drive comprising first secondary wound rotor motor means and adapted for driving said first secondary wheels means along one of said spaced rails; and a second secondary drive comprising second secondary wound rotor motor means and adapted for driving said second secondary wheel means along the other of said spaced rails; and

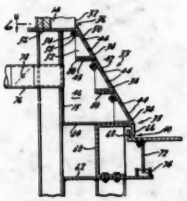
teritary drive means including a first tertiary hydraulic motor adapted for driving said first teritiary wheel means along one of said spaced rails and a second tertiary hydraulic motor adapted for driving said second tertiary wheel means along the other of said spaced rails;

said primary, secondary and tertiary drive means being operatively independent of each other.

4,576,101
STOKER

David C. Reschly, Monroe, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Filed Feb. 27, 1984, Ser. No. 583,981
Int. Cl.[4] F23L 5/00
U.S. Cl. 110—182.5 34 Claims



1. A stoker for use within a wall structure defining a combustion chamber, comprising:

a grate for supporting burning fuel and having an outer periphery disposed in spaced relation to said wall structure; and

tuyere defining means disposed around and secured to said wall structure generally above said grate;

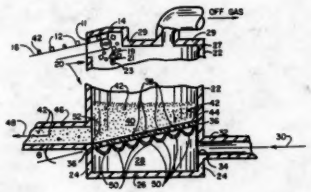
said tuyere defining means comprising a plurality of distinct tiered modules, each having a substantially smooth and downwardly converging face with apertures therein, the combined faces together forming a downwardly converging surface for containing and inwardly directing said fuel and having means receptive of pressurized air communicating with said apertures for directing said air into said combustion chamber; and

said tuyere defining means and said grate overlapping to define a baffle about the outer periphery of said grate for confining said fuel within the outer periphery of said grate.

4,576,102
REMOVAL OF TRAMP MATERIAL FROM FLUID BED VESSELS

George P. Rasmussen, and Earl S. Grimmett, both of Idaho Falls, Id., assignors to Waste-Tech Services, Inc., Idaho Falls, Id.

Division of Ser. No. 619,678, Jun. 11, 1984, Pat. No. 4,553,487, which is a continuation-in-part of Ser. No. 528,815, Sep. 2, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,813
Int. Cl.[4] F23G 5/30
U.S. Cl. 110—346 4 Claims



1. A method of uniformly fluidizing a variable depth fluid bed while progressively removing tramp material from the bed without use of moving parts comprising the steps of:

providing a single fluid bed in a vessel so that the depth of the bed varies along the transverse cross section of the bed;

supporting the entire fluid bed upon an inclined stationary grid plate having an array of fluidizing apertures but no moving parts, the stationary grid plate having an angle with respect to the horizontal less than the angle of repose of the bed material;

introducing a plurality of separate fuel particles and non-combustible tramp material into the vessel and the fluid bed;

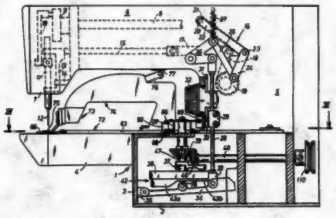
providing fluidizing air under pressure to a plenum beneath the stationary grid plate and directing the air through the array of apertures in the grid plate to uniformly vertically fluidize the entire bed and to gently walk the tramp down the incline of the stationary grid plate to a vessel discharge site solely by the forces of gravity and fluidizing air;

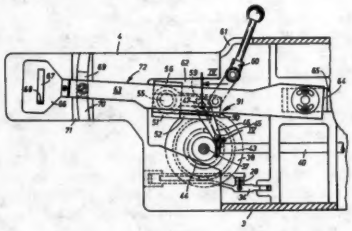
preventing flow loss of bed particles through the apertures into the plenum both while the bed is fluidized and not fluidized.

4,576,103
FEED DRIVE FOR A STITCH GROUP SEWING MACHINE

Ernst Albrecht, Hochspeyer, and Edgar Busch, Trippstadt, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 615,461, May 30, 1984, Pat. No. 4,549,491. This application Jul. 15, 1985, Ser. No. 755,064
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320158; Dec. 3, 1984, 3444061
Int. Cl.[4] D05B 3/02
U.S. Cl. 112—73 7 Claims



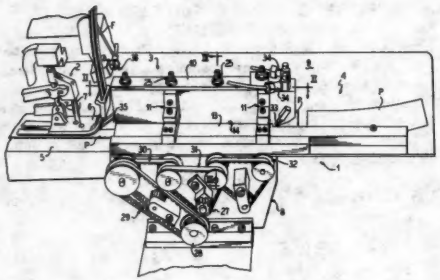


1. A stitch group sewing machine comprising a housing, a sewing needle mounted in said housing for upward and downward movement and for lateral swinging movement in a swinging plane, a sewing machine main drive motor for moving said needle in upward and downward and swinging motion, a work holder mounted on said housing for swinging movement across the swinging plane of said needle, a cam plate rotatable in said housing connected to said work holder by a transmission having a variable transmission ratio for controlling the swinging movement of said work holder, a controllable clutch device connected to said cam plate for rotating said cam plate, said drive motor being connected to said clutch device for driving said clutch device and said cam plate, and a control device connected to said main drive motor for controlling an output speed of said clutch device as a function of one of the speed of said sewing machine main drive motor, a ratio of said transmission and a length of the stitches to be formed, for varying a resultant stitch length.

4,576,104
METHOD AND APPARATUS FOR ATTACHING FLY STRIPS TO A SLIDE FASTENER CHAIN

Kazuo Miyakawa, Marietta, Ga., assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,803
Int. Cl.[4] D05B *19/00, 3/22, 27/16*
U.S. Cl. 112—265.2 32 Claims



1. An automated method of transfering successive individual pieces to a sewing machine to form a continuous series of said pieces in end-to-end relation comprising:

sewing a preceding piece in said sewing machine with a leading end of said preceding piece sewn first and a trailing end of said preceding piece sewn last,

continuously operating a drive means for driving a succeeding piece toward said sewing machine at a speed substantially faster than the rate of feed of said sewing machine until a leading end of said succeeding piece abuts the trailing end of said preceding piece as said preceding piece is being sewn, and

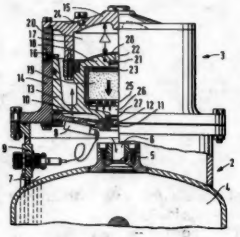
supporting said succeeding piece during said driving such that the leading end of said succeeding piece does not overlap or bunch at said preceding piece trailing end upon abutting despite continuous operation of said drive means.

27. Apparatus for automatically attaching successive fly strips to a continuous length slide fastener chain, comprising a sewing machine, means for feeding said slide fastener chain to said sewing machine for sewing onto said fly strips, means for commencing sewing of a preceding fly strip in said sewing machine, a feed station upstream of said sewing machine for delivering a succeeding fly strip towards said sewing machine, said feed station having a continuously operating drive means for conducting said succeeding fly strip through said feed station at a speed substantially faster than the rate of feed of said sewing machine until a leading end of said succeeding fly strip abuts the trailing end of said preceding fly strip as said preceding fly strip is being sewn and having a guide means for guiding said succeeding fly strip through said feed station, and means for passing successive fly strips consecutively to said feed station, such that the leading end of said succeeding fly strip does not overlap or bunch at said preceding fly strip trailing end upon abutting despite continuous operation of said drive means.

4,576,105
RESCUE EQUIPMENT FOR SUBMARINE VEHICLES

Hermann Erdmann, Weyhe, and Hermann Ramaker, Stuhr, both of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,521
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320159
Int. Cl.[4] B63G *8/24*
U.S. Cl. 114—333 13 Claims



1. In a rescue equipment for submarine vehicle, a gas generator device for blowing ballast tanks including a storage facility for a liquidous decomposable medium and a first principal gas generator; an auxiliary propulsion facility for driving the liquidous medium into the principal gas generator comprising:

a second, pilot gas generator;

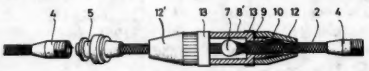
feedback and amplification means having an input connected to be responsive to gas pressure generated by the pilot generator and having an output effective for controlling the operation of the pilot generator; and

the pilot gas generator being connected for driving the liquidous medium out of its storage facility.

4,576,106
MARKER ROPE

Mitsuo Takagi, Takamatsu, Japan, assignor to Takagi Kogyo Co., Ltd., Kagawa, Japan

Filed Mar. 21, 1984, Ser. No. 592,340
Claims priority, application Japan, Jan. 30, 1984, 59-12594[U]
Int. Cl.[4] G08B *7/00;* E04H *17/00;* E01F *9/00*
U.S. Cl. 116—63 R 7 Claims



1. A marker rope which serves as a warning of danger and which is adapted to be stretched around a danger zone, comprising:

a plurality of first cords, each having a plurality of electric wires;

a plurality of luminous bodies, each connected to and spaced along the plurality of the electric wires for the first cords;

a plurality of second cords, each also having a plurality of electric wires;

a plurality of warning-sound producing units, each connected to and spaced along the plurality of the electric wires for the second cords;

means, wrapped around the plurality of electric wires for both the first and second cords, for covering both pluralities of electric wires;

each of the plurality of luminous bodies and each of the plurality of warning-sound producing units being disposed outside of the covering means;

a plurality of protective tube means, aligned coaxially with the pluralities of the first and second cords outside of the

covering means, for surrounding the plurality of luminous bodies and the plurality of warning-sound producing units; and

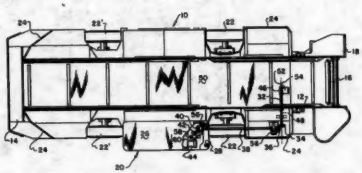
a plurality of tapered tube means, arranged coaxially on opposite ends of each one of the plurality of protective tube means, for sealing the protective tube means against leakage of rainwater coming into contact with the luminous bodies and the warning-sound producing units.

4,576,107

APPARATUS FOR DETECTING THE LEVEL OF PARTICULATE SOLIDS IN A SHUTTLE CAR

John K. Brasher, Helper, Utah, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 17, 1984, Ser. No. 611,279
Int. Cl.⁴ G01F *23/00*
U.S. Cl. 116—227 **8 Claims**



1. An apparatus for detecting an increase to a selected level of the height of a bed of particulate solids in a shuttle car for the transportation of said particulate solids, said shuttle car including a body means adapted to contain and transport said particulate solids, means for receiving said particulate solids in a first end of said shuttle car, conveyor means for moving said particulate solids along the length of said shuttle car toward a second end of said shuttle car to substantially fill said shuttle car with said particulate solids and an operator compartment for a shuttle car operator, said apparatus being positioned near said second end of said shuttle car and comprising a support member adapted to be rotatably supported on a wall of said body means for rotation about its longitudinal axis with its first end inside said body means and its second end outside said body means, a relatively flat plate member positioned on said first end of said support member in a plane generally parallel to said longitudinal axis of said support member so that said plate member is biased to extend vertically downwardly from said support member and a level indicator, said level indicator comprising an indicator member, positioned on said second end of said support member so that said indicator member is substantially horizontal when said plate member is in its vertical position and rotates generally about said longitudinal axis of said support member to a substantially vertical position when said plate member is rotatably urged toward a horizontal position by the increased height and movement of said particulate solids thereby providing an indication of such increased height to said operator.

4,576,108

APPARATUS FOR APPLYING VISCOUS SEASONING EVENLY TO TUMBLING FOOD ARTICLES

Helen M. Socola, Irving, and Michael G. Topor, Carrollton, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Oct. 3, 1984, Ser. No. 657,130
Int. Cl.⁴ B05C *5/00*
U.S. Cl. 118—19 **3 Claims**

1. An apparatus for applying a viscous slurry of seasoning or flavoring material to a moving, tumbling bed of snack food in a tumbler drum, the apparatus comprising:

(a) a reservoir containing the viscous material;

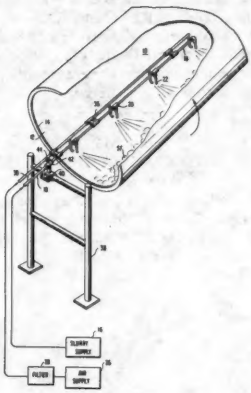
(b) a slurry pipe connected to the reservoir and extending into the interior of the tumbling drum for carrying the viscous material;

(c) a source of compressed air;

(d) a conduit and manifold connected to the source of compressed air, the conduit and manifold extending into the interior of the tumbling drum parallel and adjacent to the slurry pipe;

(e) slurry nozzles connected to the slurry pipe at spaced portions along the length thereof and inside the drum;

(f) air nozzles connected to the air manifold at spaced portions thereon along the length thereof and inside the drum, the air nozzles being spaced apart from and directed



toward streams of slurry exiting from the outlet of the slurry nozzles so that viscous slurry exiting from the slurry nozzles is atomized and dispersed by air from the air nozzles to spread the viscous slurry onto the tumbling, moving material in the drum in a relatively uniform fashion;

(g) a mechanical means connecting the air manifold to the slurry pipe as a unitary assembly; and

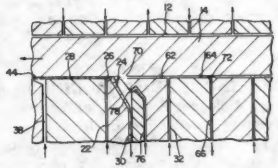
(h) a mechanical means allowing adjustment of the air manifold and slurry pipe assembly as a unit to position the same axially and rotatably relative to the slurry pipe axis for maximum affect within the tumbler drum.

4,576,109

APPARATUS FOR APPLYING A COATING ON A SUBSTRATE

Edward Bok, Burg. Amersfoordtlaan 82, 1171 DR Badhoevedorp, Netherlands

Division of Ser. No. 551,992, Oct. 24, 1983, filed as PCT NL 83/00006 on Mar. 7, 1983, published as WO 83/02910 on Sep. 1, 1983, § 102(e) Pat. No. 4,560,590.
This application May 22, 1985, Ser. No. 736,739
Int. Cl.⁴ C23C *14/00, 16/00*
U.S. Cl. 118—50 **22 Claims**



1. Apparatus for applying a coating upon an advancing substrate comprising:

a. a housing;

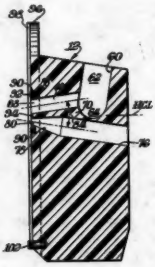
b. a longitudinal coating passage defined within said housing by a plurality of pairs of superposed segment blocks;
c. a plurality of transversely arrayed gaseous medium supply channels communicant with a pressurized gaseous medium supply, and defined within said segment blocks so as to intersect the top and bottom of said passage and advance the substrate through said passage;
d. a plurality of vacuum discharge channels defined within said segment blocks so as to intersect said passage;
e. a plurality of transversely arrayed coating medium supply channels communicant with a coating medium supply and defined within segment blocks so as to intersect said intersecting at a processing side of said passageway, adjacent said vacuum discharge channels; and
f. a first restriction gap defined in said passage intermediate said coating material supply channels and said vacuum discharge channels, so as to ensure filling of a first coating passage with coating material.

4,576,110

ROTOR HAVING A CHAMBER BLOCK WITH AN ABSORBANT PLUG

John R. Wells, Culver City, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 19, 1983, Ser. No. 496,099
Int. Cl.[4] B05C *11/08*
U.S. Cl. 118—52 **18 Claims**



1. A chamber block of the type having an inlet channel adapted to receive a sample of cells suspended in a supernatant and an outlet orifice opening on a face of the block through which the cells and supernatant pass under the influence of a centrifugal force field toward a deposition surface, wherein the improvement comprises a recess formed in the chamber block, the recess having an outlet which opens onto the same face as but is spaced from the outlet orifice, the recess having a first predetermined dimension over a first portion of its length which reduces to a lesser dimensioned portion adjacent the end of its length, the recess being sized to receive a plug of an absorbant material itself having a reduced dimensioned portion near an end thereof and to support the reduced dimensioned portion of the plug against the lesser dimensioned portion of the recess such that the end of the plug lies within a predetermined close dimension of the deposition surface.

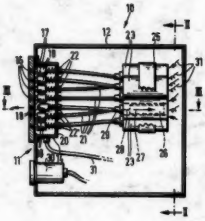
4,576,111

MARKING JET DISCHARGING HEAD

Jan Slomianny, Cologne, Fed. Rep. of Germany, assignor to Domino Printing Sciences Plc, England

Filed Jan. 23, 1984, Ser. No. 573,303
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302617
Int. Cl.[4] B05C *5/02*; B05B *1/02*
U.S. Cl. 118—313 **8 Claims**

1. A printing jet discharge head assembly for applying characters to an article, said head assembly comprising:
a chamber for receiving and holding printing liquid under pressure;
a plurality of outlet orifices in said chamber for discharging printing liquid therefrom, said outlet orifices being arranged sufficiently close together to form legible characters from the discharges of said orifices;
a plurality of closure elements within said chamber and operatively associated with respective outlet orifices, said closure elements being selectively displaceable toward and away from said outlet orifices for closing and opening respective orifices;
resilient means to urge said closure elements toward said outlet orifices for closing said orifices;
a plurality of pulling means for selectively moving said



closure elements away from said outlet orifices for opening said orifices to discharge printing liquid therefrom to form the characters, said pulling means comprising a plurality of selectively operable actuators located outside said chamber, said actuators being of a size too large to enable direct coupling to said closely spaced closure elements, and a corresponding plurality of flexible pulling elements, each of said flexible pulling elements connecting a respective one of said actuators with a respective one of said closure elements to enable said actuators to selectively withdraw said closure elements from said orifices, the flexible pulling elements obtaining the coupling of the actuators to the closure element while permitting a substantially unrestricted location of said actuators relative to said chamber and closure elements.

4,576,112

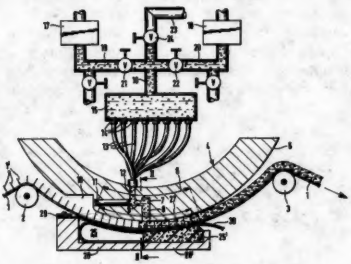
DEVICE FOR APPLYING A TREATMENT MEDIUM, ESPECIALLY IN FOAM FORM, TO A RUNNING WEB OF MATERIAL

Bernhard Funger, Krefeld; Heinz Grüber, Tonisvorst; Werner Hartmann, Krefeld; Julius Kohnen; Johannes Kütz, both of Tonisvorst, and Manfred Moser, Krefeld-Fischeln, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld-Forstwald, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,677
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315770
Int. Cl.[4] B05C *3/02*
U.S. Cl. 118—415 **33 Claims**

1. In a device for applying a treatment medium to a running web of material comprising a stationary application beam which extends transversely to the web of material and parallel to its surface, said beam resting with a sliding surface against the surface of the web of material directly in contact therewith and containing an inner chamber extended over its length; feed lines for the treatment medium leading into said chamber; a slot extending along the application beam, opening into the sliding surface; and a support arranged opposite the slot on the other side of the web of material for supporting the web of material travelling past the slot, the improvement comprising: the sliding surface having a convex shape; the support formed by a cushion with a closed surface which extends over the length and width of the slot; said cushion covering the edge of the

slot; said cushion elastically resilient at least perpendicular to the sliding surface but support to be stationary overall; said cushion pressing the web of material against the sliding surface in the vicinity of the slot; and said web of material looped



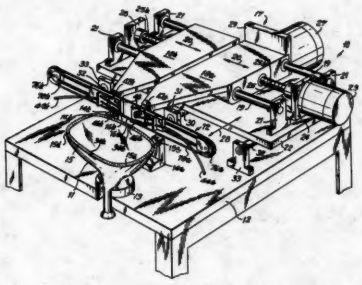
under the application beam on a looping angle such that the contact area of the web of material at the convex sliding surface is at least as large as the contact area of the cushion at the web of material.

4,576,113

APPARATUS FOR COATING VISCOUS MATERIAL ON A SEAL EDGE SURFACE OF A CATHODE RAY TUBE

Goro Kambara, Valley Center, and Makoto Fujii, Escondido, both of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,229
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—697 14 Claims



1. Apparatus for applying a viscous material to a surface of an article comprising:

a source of supply of said viscous material under pressure having an outlet,

hose means extending from said outlet,

nozzle means,

bellows means connecting said hose means with said nozzle means and continuously communicating with the latter for supplying said viscous material under pressure from said source through said hose means and said bellows means so as to be discharged at said nozzle means, said bellows means being expansible and contractible for influencing the discharge of the viscous material from said nozzle means,

valve means at said outlet of the source for controlling the flow of the viscous material from said source to said hose means,

valve control means for opening and closing said valve means, and

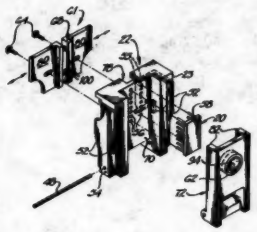
means for contracting and expanding said bellows means in correspondence with the opening and closing, respectively, of said valve means.

4,576,114

CRYSTAL PLATING SLUG APPARATUS

Alan Kaplan, West Caldwell, and James Amato, Bloomfield, both of N.J., assignors to Emkay Manufacturing Co., East Hanover, N.J.

Continuation of Ser. No. 394,434, Jul. 1, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,154
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—720 21 Claims



1. A crystal plating device comprising:

a block adapted to be removeably positioned within a plating chamber;

means on said block adapted to receive the electrical contacts of a circuit board having more than two contacts, said board having a crystal to be plated;

a plating mask moveably connected to said block to be disposed in one position for masking the crystal in a circuit board and in another position for receiving a circuit board;

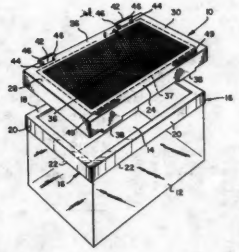
conducting means on said block adapted to conduct between less than all means adapted to receive the electrical contacts of circuit board and a crystal energizing circuit in a plating chamber to conduct between the electrical contacts for the crystal and crystal energizing circuit; and contacting means connected to said block to contact electrical contacts for the circuit board received in said block and electrically connect the electrical contacts associated with the crystal with said conducting means.

4,576,115

TANK COVER

Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520

Filed Nov. 5, 1984, Ser. No. 668,283
Int. Cl.[4] A01K *64/00*
U.S. Cl. 119—5 11 Claims



7. A cover for an animal tank, fish tank or the like having an open top and an engageable rim comprising a screen integral with and surrounded by a continuous frame having a border member, the cross section of which comprises a horizontal wall adapted to rest on top of said tank and a vertical skirt wall adapted to loosely fit over the edge portion of the top of the tank, said frame having a plurality of resilient tabs integrally

depending from the border member and a plurality of tabs movably depending from and through another portion of said border member, said movable tabs being adjustable relative to said horizontal wall, and each of said tabs having rim engaging means thereon for engagement with the engageable rim, and means for biasing the movable tabs into engagement with the tank to secure said cover on said tank and in engagement with the engageable rim.

4,576,116

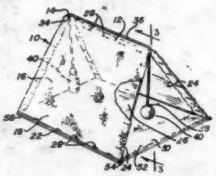
COLLAPSIBLE HOUSE FOR CATS

Gerald A. Binkert, 308 Gould Ave. SE., Bemidji, Minn. 56601

Filed Feb. 7, 1985, Ser. No. 699,012

Int. Cl.[4] A01K *1/02*

U.S. Cl. 119—19 **10 Claims**



1. A collapsible A-frame house providing a common site for a cat to rest, exercise and play, comprising

(a) a roof formed of a single unitary continuous flexible layer-type material having a backside and a cushiony outward face, said roof including an elongate peak and two roof panels integral with the peak and depending downwardly and outwardly from the peak, each said roof panel having a bottom edge, the outward face of the flexible layer-type material being the outward face of the roof and being adapted to withstand cat clawing, the peak of the roof being adapted for flexing in a hinge-like manner to permit inward movement of the roof panels toward one another when the house is to be collapsed;

(b) a stiffening means on the backside of each roof panel for supporting the same;

(c) a floor panel formed of a single unitary continuous flexible layer-type material having a bottom side and a cushiony top side, said floor panel having opposing edges thereof affixed to the bottom edges of the roof panels to limit the separation distance between said bottom edges, the floor panel being adapted for folding along its longitudinal center line generally parallel to its opposing edges, and the flexible layer-type material adjacent the junction of the bottom edges of the roof panels and the opposing edges of the floor panel being such as to serve a hinge function for allowing the floor panel to fold as the roof panels move inwardly towards one another in collapsing the house into a folded condition; and

(d) a cord having two ends slidably passing through opposite end portions of the peak into the house, said cord having at least one object connected to each end for cat amusement and for preventing the cord ends from passing out of the peak when the cord is employed as a manual handle for lifting the house.

4,576,117

LIVESTOCK FEEDING APPARATUS

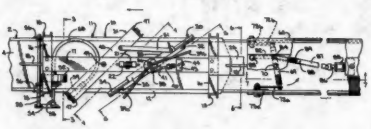
Gary L. Garber, Metamora, and Marcus N. Allhands, Sycamore, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Jun. 25, 1984, Ser. No. 624,451

Int. Cl.[4] A01K *5/00*; B65G *47/46*

U.S. Cl. 119—52 B **16 Claims**

1. A livestock feed apparatus, comprising a supporting structure, an endless conveyor belt mounted to travel on said supporting structure in an upper run and a lower run, feed supply means for supplying feed to the upper run of the belt, a feed discharge unit disposed above said upper run for selectively discharging feed from either side edge of said belt, said unit including a frame, plow means carried by the frame and having a blade disposed to ride against the upper run of said belt, brush means carried by the frame and including a rotatable brush disposed generally parallel to said plow means, pivot means for pivoting said plow means and said brush means from a first diagonal position in which said blade and said brush extend



diagonally to a side edge of the belt to a second position in which said blade and said brush extend at a second angle to the side edge of the belt, means responsive to movement of the belt for rotating the brush about its axis, drive means for moving said unit in a reciprocating path along the length of the conveyor, and shifting means responsive to said unit reaching a predetermined location in its reciprocating path of travel for pivoting the plow means and said brush means from the first position to the second position to thereby discharge feed from the opposite side edge of the belt.

4,576,118

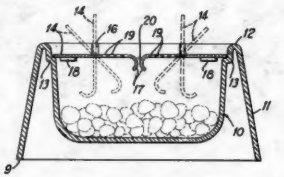
PET FEEDING BOWL

Winston R. Meadows, 2961 Collier Dr., N.W., Atlanta, Ga. 30318

Filed Mar. 4, 1985, Ser. No. 707,880

Int. Cl.[4] A01K *5/00*

U.S. Cl. 119—62 **7 Claims**



1. A pet feeding bowl of the type having a bowl body portion defining an interior at about ground level for receiving and retaining food therein, said bowl body portion having an open top through which the pet can have access to the food retained in said bowl body portion, the improvement comprising:

(a) a cover for essentially closing the top portion of said bowl body portion, said cover having a pair of opposed moveable cover plate sections which in their closed position respectively extend from opposite sides of said bowl body portion over the open top of said bowl body portion for covering the food in said bowl body portion said cover plate sections when in their closed positions having adjacent edge portions abutting each other in the central portion of said bowl cover plate sections and being carried in a common horizontal plane by said bowl body portion, said edge portions of said cover plate sections curved downwardly for being engageable by the nose or snout of a pet to urge the cover plate sections away from each and thereby move them to their open positions as the pet inserts his snout or nose between said plates and through said open top toward said food; and

(b) means for biasing said cover plate sections for returning said cover plate sections to their closed positions when the

pet removes his snout or nose from said bowl body position.

4,576,119

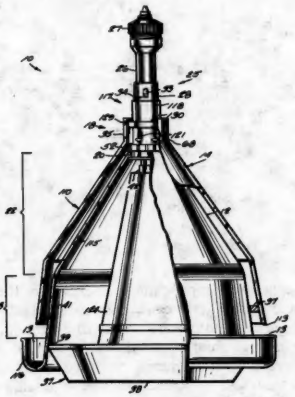
DRINKER SHROUD

Helmut Rader, 1182 Dolly Madison Blvd., McLean, Va. 22101

Filed Jul. 19, 1983, Ser. No. 515,268

Int. Cl.[3] A01K 7/00

U.S. Cl. 119—81 19 Claims



1. A poultry drinker comprising:

a bell including a watering trough formed at the bottom thereof and including means defining a substantially central opening at the top thereof;

valve means including a valve body having a valve member for allowing or preventing flow of liquid through the valve body to the trough;

means for operatively interconnecting said bell and valve means so that said bell is movable with respect to said valve body to actuate or deactuate said valve member depending upon the amount of water in said trough, water from said valve means flowing to said trough; and

a shroud generally concentric with said bell and disposed exteriorly of the exterior periphery of said bell, said shroud substantially coextensive with said bell over the entire length thereof except for said trough and for preventing contamination of said bell exterior surface over substantially the entire extent thereof, and mounted with respect to said bell and valve means so that operation of said valve means by said movement of said bell with respect to said valve body is substantially unimpeded.

4,576,120

HEAT EXCHANGER

Heinz Ammann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 30, 1984, Ser. No. 645,718

Claims priority, application Switzerland, Sep. 8, 1983, 4903/83

Int. Cl.[4] F22B 37/00

U.S. Cl. 122—6 A 11 Claims

1. A heat exchanger comprising

a plurality of walls defining a vertical flue, each said wall including a plurality of interconnected tubes;

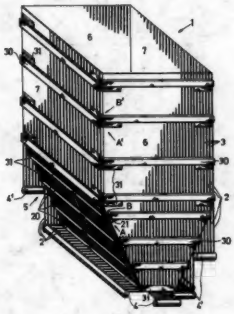
at least one first flanged girder extending parallel to one of said walls at a first level of said flue for receiving flexural stresses from said wall;

a first tension band rigidly connected in parallel to a second wall adjacent said one wall;

at least one first connecting element rigidly connected to said first tension band at predetermined fixing points disposed symmetrically of a central plane of said first tension band;

at least one first link mounted on said first connecting element and pivotally connected to one end of said first girder on an axis parallel to said second wall and perpendicular to said first girder, said first link being disposed to transfer a flexural stress from said first girder to said first tension band within said central plane of said first tension band;

at least one second flanged girder extending parallel to said second wall at a second level of said flue for receiving flexural stresses from said second wall;



a second tension band rigidly connected in parallel to said one wall;

at least one second connecting element rigidly connected to said second tension band at predetermined fixing points disposed symmetrically of a central plane of said second tension band; and

at least one second link mounted on said second connecting element and pivotally connected to one end of said second girder on an axis parallel to said first wall and perpendicular to said second girder, said second link being disposed to transfer a flexural stress from said second girder to said second tension band within said central plane of said second tension band.

4,576,121

CONVECTIVE HEATER

Robert M. Thorogood, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Jan. 27, 1984, Ser. No. 540,232

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.[4] F22D 1/00

U.S. Cl. 122—7 R 9 Claims

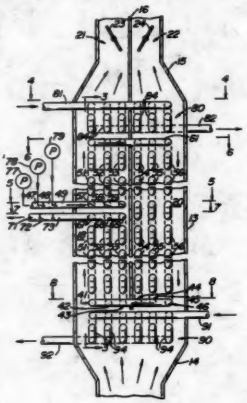
1. A convective heater downstream of a radiant burner for heating fluids such as a slurry or the like comprising:

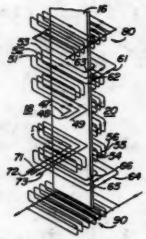
(a) means defining an elongated heating chamber having an inlet at one end and an outlet at its other end, imperforate means dividing said elongated chamber along its length and extending the total length of said chamber into two parallel heating gas flow paths, each of said flow paths being in the same direction wherein the heated gases passing from said inlet to said outlet are divided into two heating gas streams passing upwardly in the same direction;

(b) conduit means for passing said fluid to be heated in a continuous series flow through said heating chamber in heat exchange relationship with the heating gases passing from said inlet to said outlet;

(c) said conduit means being constructed and arranged to provide a continuous series mixed flow tube circuit in which the fluid to be heated enters one of said heating gas

flow paths at a location between said inlet and said outlet to flow in a co-current direction with said heating gases through said one path to a location near said outlet whereat said tube circuit transfers in series flow to said other heating gas path to then flow in a counter-current direction relative to said heating gas through said other path to a location near said inlet whereat said tube circuit transfers in series flow back to said one path to flow in a co-current direction to said entry location whereat said tube circuit leaves said one path, and





wherein said tube circuit comprises tubes arranged in a serpentine-like arrangement passing back and forth transversely through said heating chamber as the fluid to be heated flows in said co-current and counter-current flow paths, said serpentine arrangement of tubes comprising return bends located externally of said heating chamber, said tube circuit comprising a plurality of parallel stacks of tubes in each of said paths.

4,576,122

ROAD-MARKING MATERIAL HEATING SYSTEM

Forrest C. Marcato, 823 James Ct., Pike Road, Ala. 36064

Filed Mar. 20, 1984, Ser. No. 591,415
Int. Cl.⁴ F22B *9/02*
U.S. Cl. 122—26 **26 Claims**

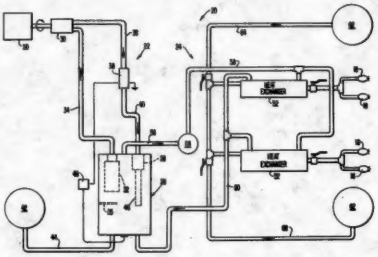
1. A mechanical heat-generating system for indirectly heating a road-marking material being applied onto a road surface from a vehicle comprising:

heat exchanger means for placing a road-marking material in indirect contact with a heat exchange fluid at an elevated temperature to raise the temperature of the road-marking material;

heat exchange fluid storage tank means for storing a reservoir of the heat exchange fluid at a preselected elevated temperature during road-marking material application;

heat-generator means for mechanically heating the heat exchange fluid during the passage of the fluid through the generator to raise the temperature of the heat exchange fluid to be passed to said heat exchange fluid storage tank means;

conduit means for connecting in fluid communication said heat exchanger means, said storage tank means and said heat-generator means; and



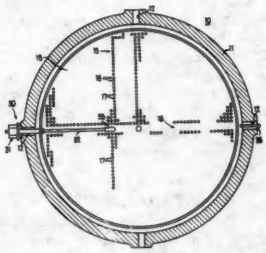
pump means for pumping the heat exchange fluid through said heat exchanger means, said storage tank means and said heat-generator means so that the temperature of the heat exchange fluid is raised during its passage through said heat-generator means, the heat exchange fluid is passed from said heat-generator means to said storage tank means to be stored therein at the preselected elevated temperature and is passed from said storage tank means to said heat exchanger means.

4,576,123

WORKPIECE POSITIONING APPARATUS WITH PLURAL SENSORS

Edward J. Lahoda, Edgewood, and David A. Eckhardt, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1984, Ser. No. 632,976
Int. Cl.⁴ F22B *37/54*; F28F *15/00*; F28G *9/00*
U.S. Cl. 122—382 **20 Claims**



1. Apparatus for accurately positioning a workpiece with respect to the vertical tubes of a nuclear steam generator wherein the tubes are disposed in an array of parallel rows and parallel columns, with the tubes in each column having their axes aligned in a common column plane with a predetermined spacing between the tubes of adjacent columns, said apparatus comprising transport means for moving the workpiece past the columns of tubes closely adjacent thereto in directions perpendicular to the column planes thereof, a plurality of sensing means associated with the workpiece for movement therewith, each of said sensing means being responsive to adjacent tubes for producing a detection signal which varies as a function of

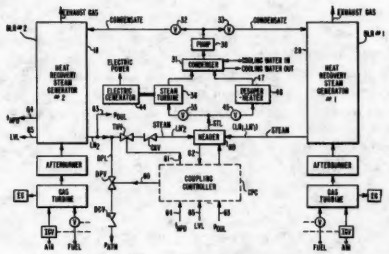
the distance between said sensing means and the closest one of the tubes, said sensing means being positioned so that the detection signals therefrom are related by a predetermined function, and reprocessing means coupled to each of said sensing means and responsive to the detection signals therefrom for producing in accordance with said predetermined function a position-indicating signal which is a maximum when the workpiece is in a predetermined position with respect to one of the column planes.

4,576,124

APPARATUS AND METHOD FOR FLUIDLY CONNECTING A BOILER INTO PRESSURIZED STEAM FEED LINE AND COMBINED-CYCLE STEAM GENERATOR POWER PLANT EMBODYING THE SAME

Alan Martens, Berwyn; Kermit R. Wescott, Kennett Square, and Bennie E. Snow, West Chester, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1984, Ser. No. 664,638
Int. Cl.[4] F22D 7/00
U.S. Cl. 122—406 ST 4 Claims



1. Apparatus for starting a steam boiler and for coupling a steam output thereof through a throttle valve and a header to a steam feed line at an operative pressure and temperature comprising:

means for draining through a bypass line steam from said steam output before said throttle valve with said throttle valve being closed initially;

with said draining means including a controlled drain valve and control means controlling said drain valve in a first mode for admitting a derivation flow at predetermined minimal constant flow level in said bypass line as the pressure of said steam output is increasing from substantially zero level; said controlled valve in a second mode admitting in said bypass line from said steam output a derivation flow increasing in relation to the increase of said steam output;

said control means controlling said draining means in the second mode to pass a derivation flow corresponding substantially to said operative pressure at said steam output for closing said drain valve and subsequently for opening said throttle valve, whereby said header receives steam concurrently from said feed line and from said boiler at substantially the same operative pressure;

with first means for sensing the operative pressure in said header;

second means for sensing pressure of said output steam;

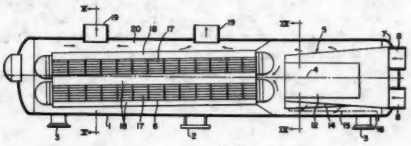
said control means being responsive to a pressure intermediate between said substantially zero level pressure and said operative pressure to shift operation from said first mode to said second mode.

4,576,125

WATER SEPARATOR FOR DRYING WET VAPOR, WITH SUBSEQUENT SUPERHEATING OF THE DRIED VAPOR

Günter Keintzel, and Klaus Westebbe, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 586,008
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307101
Int. Cl.[4] F23G 1/00
U.S. Cl. 122—483 1 Claim



1. An arrangement containing a water separator for drying wet vapor, and a superheater for subsequently superheating the dried vapor; said arrangement including:

a horizontal, cylindrical tank having a central axis, at least one inlet for wet vapor, at least one outlet for superheated dry vapor, and at least one outlet for separated water;

a water separator disposed in said tank and, in the direction of said central tank axis, having the shape of a truncated pyramid or cone; said water separator being in communication with said at least one inlet for receiveing wet vapor therefrom; said water separator having improvement in combination therewith which comprises bundles of laminations arranged in pairs and in two rows extending in a horizontal plane substantially in the axis of the cylindrical tank as well as having vapor discharge surfaces that are disposed symmetrically, vertically, and in tiers relative to said central tank axis, and that are disposed at an angle generally in a range of from 10–170° preferably in a range of from 50–70° relative thereto; said at least one outlet for separated water being in communication with said bundles of laminations for receiving separated water therefrom;

a superheater disposed in said tank coaxially with said water separator and in communication therewith for receiving dried vapor therefrom; said superheater having improvement in combination therewith which comprises tube bundles which are uniformly disposed about said central tank axis and can vary in number and type of construction; said at least one outlet for superheated dry vapor being in communication with said tube bundles for receiving superheated dry vapor therefrom, said bundles of laminations being symmetrically arranged relative to the axis of the cylindrical tank with a distance spacing decreasing in a direction towards said superheater; and

connecting plates located between said bundles of laminations and interconnecting said bundles of laminations for predetermined flow guidance therewith.

4,576,126

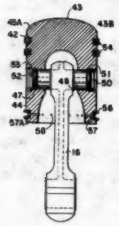
TWO-STROKE INTERNAL COMBUSTION ENGINE

Antonio D. Ancheta, 446 Toronto St., Winnipeg, Manitoba, Canada R3G 1S5

Continuation-in-part of Ser. No. 418,277, Sep. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 197,003, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,687, Jul. 23, 1979, abandoned. This application Mar. 16, 1984, Ser. No. 590,416
Int. Cl.[4] F01P 1/04
U.S. Cl. 123—41.38 9 Claims

1. A two-stroke supercharged multi-cylinder internal combustion engine, comprising in combination a cylinder block having cylinder bores formed therein, a cylinder head on an upper end of the cylindrical bores defining a main combustion chamber, a piston assembly in each of said cylinder bores and

including a piston having a domed head and a connecting rod operatively connected to said piston for reciprocating same between top dead center and bottom dead center, said piston including means to reduce and control the escape of lubricating oil therepast, said means including said piston assembly having a piston skirt extending from said head, a pair of diametrically opposed wrist pin bosses in said skirt below said domed head, a wrist pin mounted within said bosses with a retainer ring installed in an annular groove formed in an outermost edge portion of each of said bosses adjacent outer ends of the wrist pin for restricting endwise movement of said wrist pin, said wrist pin operatively connecting said connecting rod to said piston, sealing "O" rings having high temperature resistance properties installed in an annular groove formed in each of said bosses of the piston adjacent to each end portion of the wrist pin after assembly to prevent the escape and discharge of lubricating oil therepast, at least two compression piston rings situated in spaced and parallel grooves in the head of said piston above said wrist pin bosses and at least one oil scraper ring mounted within an annular groove around the skirt close



to a lower edge portion of said skirt, drain holes extending from said groove through said skirt to control and prevent the escape of lubricating oil past individual scavenging port and exhaust port openings, said oil scraper ring always remaining below lowermost edges of said scavenging port and said exhaust port opening when said piston is at top dead center of its stroke, a crankshaft mounted for rotation at a base of the said cylinder block, a re-circulating type constant pressure feed oil pump mounted in the base of said cylinder block and being operatively driven by said crankshaft, an oil pan enclosing the lower side of the cylinder block, said crankshaft and said oil pump, said pump being operatively connected to the lubricating system of said engine, said cylindrical bores having said individual scavenging port and exhaust port openings formed in the lower side of each cylindrical wall in the same plane and axial position, said scavenging port lower side opening inclining inwardly and upwardly towards the walls of the cylinder, said scavenging port and exhaust port openings being both uncovered and covered simultaneously by the reciprocating piston passing thereby.

4,576,127

VALVE TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Isao Doi, Isehara; Takashi Mihashi, Yokosuka, and Shoichiro Yokota, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed May 10, 1985, Ser. No. 732,716

Claims priority, application Japan, May 14, 1984, 59-94669

Int. Cl.[4] F01L *1/12*

U.S. Cl. 123—90.15 **7 Claims**

1. A valve timing control device for an engine having a crankshaft and a pair of camshafts for operating intake and exhaust valves, comprising:

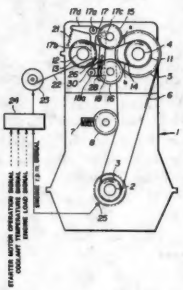
a driving wheel mounted on the crankshaft to rotate together therewith;

a pair of first and second driven wheels mounted on one of the camshafts to rotate together therewith;

a third driven wheel mounted on the other of the camshafts to rotate therewith;

a first power transmitting member passing about said driving wheel and said first driven wheel to transmit rotation of the former to the latter;

a second power transmitting member passing about said second driven wheel and said third driven wheel to transmit rotation of the former to the latter and having a tension side section and a slack side section extending between said second and third driven wheels;



a pair of first and second adjusting wheels respectively brought into contact with said tension side section and said slack side section of said second power transmitting member and shiftable in unison with each other toward and away from said tension side section and said slack side section so as to vary the lengths of same; and

means for driving said adjusting wheels to shift in accordance with operating conditions of the engine.

4,576,128

VALVE OPERATION STOPPING MEANS FOR MULTI-CYLINDER ENGINE

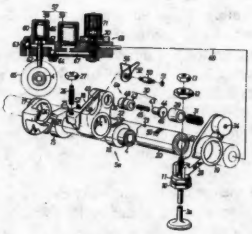
Kenich Nagahiro, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,424

Claims priority, application Japan, Dec. 17, 1983, 58-238424

Int. Cl.[4] F02D *13/06*

U.S. Cl. 123—198 F **19 Claims**



1. In a valve operating mechanism for multi-cylinder internal combustion engine including a cam shaft with a plurality of cams formed integrally with said cam shaft at positions corresponding to suction valves and exhaust valves for each cylinder, a valve operation stopping device comprising a drive rocker arm engaging one of said cams, a driven rocker arm engaging one of either the suction valves or the exhaust valves, said drive rocker arm and said driven rocker arm being pivotably supported on the same axis to permit relative angular displacement, a synchro pin slidably mounted in said driven rocker arm to engage with said drive rocker arm to prevent

said relative axial displacement, means biasing said synchro pin toward engagement with said drive rocker arm, and a timing piston provided in said drive rocker arm at a position corresponding to said synchro pin and acting to urge said synchro pin toward said driven rocker arm by hydraulic pressure to release connection between said drive rocker arm and said driven rocker arm.

4,576,129

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

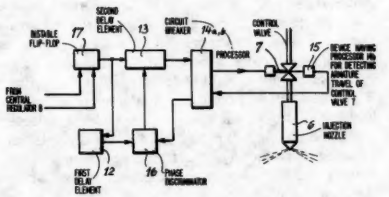
Gerd Wallenfang, Cologne, and Manfred Glöckner, Pulheim, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,802

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302293

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **24 Claims**



1. A fuel injection system for an air-compressing, spontaneous-ignition, reciprocating piston internal combustion engine which is provided with a fuel injection pump and an injection nozzle respectively for each cylinder unit, each of which is provided on a high pressure side of the fuel injection pump with at least one electromagnetic control valve for regulating at least one parameter which characterizes the injection process; each control valve is adapted to be controlled from an electrically operating data processor by means of a control pulse as a function of characteristic operating parameters of said internal combustion engine; the improvement comprises:

a delaying device for and associated with each of said electromagnetic control valves; each delaying device, while taking into account the transmission characteristics of its control valve, transmits said control pulse of said data processor to said control valve in such a way that the latter opens and/or closes with a constant time delay during each control procedure; this constant time delay of said control valve is adapted to be established as a function of the actual speed of said internal combustion engine; the control time point of said control valve, as determined by said data processor, for opening and/or closing said control valve, is adapted to be varied as a function of said constant time delay; each delaying device comprising:

a first delay element having a constant time delay as a reference time for said control valve;

a second delay element having a variable time delay for said control valve;

a circuit breaker;

a device, which is provided with a processor, for detecting the armature travel of said control valve;

a phase discriminator; and

said control pulse of said data processor can be conveyed to said first and said second delay elements; in which said control valve can be controlled by said second delay element; and in which said device for detecting the armature travel of said control valve delivers an actual value to said phase discriminator, and said first delay element delivers a desired value to said phase discriminator, which, as a function of the desired value/actual value comparison, generates a control value for regulating said second delay element such that summation of adjusted delay time of said second delay element and response time of said control valve corresponds to the constant time delay of said first delay element.

4,576,130

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

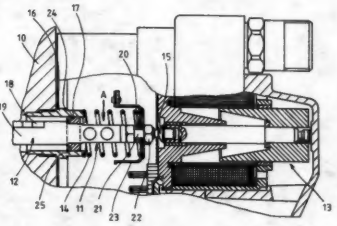
Walter Hafele, Feilbach, and Peter Knorreck, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 671,264, Nov. 14, 1984, abandoned. This application Dec. 12, 1984, Ser. No. 680,970

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3442953

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—372 **14 Claims**



1. A fuel injection pump for internal combustion engines, comprising a pump housing and a supply quantity adjusting member adjustable by an electrically controlled final control element, said supply quantity adjusting member having a profiled governor rod supported in said pump housing, said profiled governor rod includes a main body portion with a shank end in proximity to said final control element, said rod further having an end arranged to extend out of the pump housing toward the final control element, a cylindrical slide bearing sheath secured in said pump housing in proximity to said profiled governor rod, and a displaceably disposed cylindrical governor rod guide ring having a tilt-proof minimal axial length firmly seated on said shank end of said main body portion and secured to said profiled governor rod to close off said governor rod in a sealing manner relative to said cylindrical slide bearing sheath and to the final control element to thereby achieve the least possible radial play in the slide bearing sheath to prevent an overflow of oil from said pump housing to the final control element and a coupling element secured to said shank end of said profiled governor rod for transmitting adjusting forces to said profiled governor rod and further that said guide ring is secured to said shank end between a front face of said coupling element and a shoulder provided on said main body portion of said profiled governor rod.

4,576,131

INTAKE CONTROL SYSTEM FOR MULTI-VALVE TYPE INTERNAL COMBUSTION ENGINE

Keiichi Sugiyama, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Division of Ser. No. 588,358, Mar. 2, 1984, Pat. No. 4,512,311, which is a continuation of Ser. No. 312,673, Oct. 19, 1981, abandoned. This application Feb. 15, 1985, Ser. No. 701,958

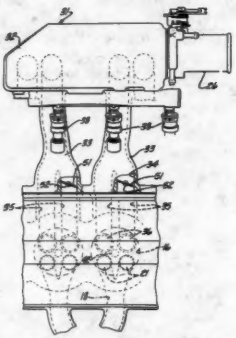
Claims priority, application Japan, Oct. 20, 1980, 55-147150

Int. Cl.⁴ F02M *35/10*; F02D *9/08*

U.S. Cl. 123—432 **4 Claims**

1. In an induction system for a chamber of an internal combustion engine having inlet means communicating with said chamber for delivering a charge thereto, said inlet means com-

prising a pair of intake passages each serving said chamber, main throttle valve means in said inlet means upstream of said intake passages for controlling the flow therethrough, exhaust means communicating with said chamber for receiving a burnt charge therefrom, means for controlling the communication of said inlet means and said exhaust means with said chamber for providing for opening of said inlet means prior to full closure of said exhaust means, the improvement comprising means for limiting the effective area of said inlet means during idle for minimizing the backflow of exhaust products into said inlet means when said inlet means and said exhaust means are both



open and for reducing said restriction when said engine is in an off idle condition comprising single throttle valve positioned in only one of said intake passages downstream of said main throttle valve means and means for commencing the opening of said single throttle valve immediately upon opening said main throttle valve past its idle condition, said means for opening said single throttle valve comprises linkage means interconnecting said single throttle valve with said main throttle valve and adapted to open said single throttle valve at a faster rate than said main throttle valve is opened so that said single throttle valve is in its fully open position prior to full opening of said main throttle valve.

4,576,132

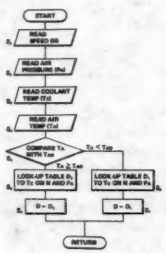
ENGINE STARTING AIR FUEL RATIO CONTROL SYSTEM

Masataka Nakajima, Tokyo; Yasushi Mase, Hachioji, and Yoshiharu Tamura, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1984, Ser. No. 666,038

Int. Cl.[4] F02D *41/06*

U.S. Cl. 123—438 **7 Claims**



1. An engine-starting air-to-fuel ratio control system incorporated with a carburetor for supplying the amount of fuel into an engine according to the amount of intake air, which comprises:

(a) an engine speed sensor for outputting an engine speed signal;

(b) an intake air pressure sensor for outputting an intake air pressure signal;

(c) an engine coolant temperature sensor for outputting an engine coolant temperature signal;

(d) an intake air temperature sensor for outputting an intake air temperature signal;

(e) fuel control means for determining the amount by which fuel is to be increased in response to the detected engine speed signal, the detected intake air pressure signal, the detected engine coolant temperature signal and the detected intake air temperature signal, and for outputting a control signal representative of the amount of fuel to be increased, said control means comprising a microcomputer for outputting a control pulse signal, the duty factor thereof being controlled in accordance with table look-up method with the detected engine speed, intake air pressure, coolant temperature and intake air temperature as parameters, said duty factor of the control pulse signal being retrieved according to the detected coolant temperature T_C from a lower air temperature table D_1 selected with the detected engine speed N and intake air pressure P_A as parameters when the detected intake air temperature T_A is lower than a reference intake air temperature T_{AO}, and from a higher air temperature table D_2 selected with the detected engine speed N and intake air pressure P_A as parameters when the detected intake air temperature T_A is equal to or higher than the reference intake air temperature T_{AO}; and

(f) an actuator associated with the carburetor and activated in response to the control signal outputted from said control means for increasing the amount of fuel to be supplied to the engine through the carburetor.

4,576,133

LIQUID FUEL INJECTION PUMPING APPARATUS

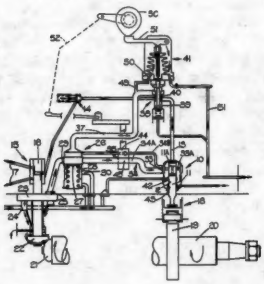
Terence M. B. Silcock, Pinner, and Colin T. Timms, Harrow Weald, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jan. 3, 1985, Ser. No. 688,516

Claims priority, application United Kingdom, Jan. 21, 1984, 8401626

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—458 **10 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine, comprising a high pressure reciprocable plunger fuel injection pump having a pumping chamber and an outlet connected in use, to an injection nozzle of an associated engine, a low pressure supply pump for supplying fuel under pressure to the high pressure pump during the filling periods thereof, passage means connecting the

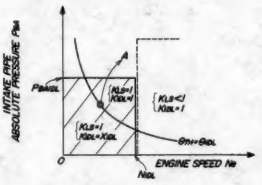
supply pump to an inlet of the high pressure pump, an electrically controlled spill valve operable to divert fuel at high pressure from the high pressure pump during inward movement of the plunger, thereby to control the amount of fuel supplied through said outlet, manual means operable to prevent flow of fuel through the spill valve in the event of electrical failure, a valve associated with said passage means and operable in the event of electrical failure to provide a variable restriction to the flow of fuel through said passage means to the high pressure pump whereby the apparatus can continue to supply fuel to an associated engine, a spill path from the pumping chamber of the high pressure pump, fuel flowing through said spill path flowing along said passage means, said spill path being uncovered at a predetermined position during inward movement of the plunger to terminate delivery of fuel by the apparatus.

4,576,134

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES CAPABLE OF IMPROVING ACCELERABILITY OF THE ENGINE FROM AN IDLING REGION THEREOF

Akihiro Yamato, and Yutaka Otobe, both of Shiki, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,532
Claims priority, application Japan, Jun. 21, 1983, 58-111664
Int. Cl.[4] F02D *41/08*
U.S. Cl. 123—480 **9 Claims**



1. A fuel supply control method for an internal combustion engine having an intake passage and an exhaust passage, a throttle valve arranged in said intake passage, and exhaust gas purifying means arranged in said exhaust passage, the method being adapted to store a plurality of predetermined basic fuel quantity values which correspond, respectively, to a plurality of predetermined values of at least one operating parameter of said engine indicative of intake air flow rate, other than throttle valve opening, and the rotational speed of the engine, read out one of said predetermined basic fuel quantity values which corresponds to the detected value of said at least one operating parameter, determine from said read one basic fuel quantity value a quantity of fuel appropriate to an operating condition in which said engine is operating, and supply the determined quantity of fuel to said engine, the method comprising the steps of:

(a) setting at least part of said basic fuel quantity values which correspond to ones of said predetermined values of said at least one operating parameter that are to be assumed when said engine is operating in an idling region, at such predetermined values as to obtain an air-fuel mixture having a predetermined air-fuel ratio at which said exhaust gas purifying means can exhibit an optimum conversion efficiency thereof;

(b) detecting the valve opening of said throttle valve, determining whether or not the detected valve opening of said throttle valve is equal to or smaller than a predetermined value corresponding to a substantially fully closed position of said throttle valve, and determining that said engine is operating in said idling region when the detected valve opening of said throttle valve is equal to or smaller than said predetermined value; and

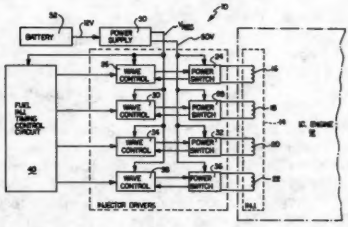
(c) decreasing by a predetermined correction value each of said at least part of said basic fuel quantity values set to said predetermined values, which is read out, when it is determined that said engine is operating in said idling region.

4,576,135

FUEL INJECTION APPARATUS EMPLOYING ELECTRIC POWER CONVERTER

Ronald M. Johnson, Rochester, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 24, 1984, Ser. No. 603,492
Int. Cl.[4] F02D *41/20*
U.S. Cl. 123—490 **9 Claims**



1. Apparatus for use in conjunction with an internal combustion engine including electrically operated fuel injectors and a battery for providing electrical power to operate said injectors comprising:

means for converting the DC voltage signal provided by said battery into a first oscillating voltage signal and responsive to a feedback signal for controlling at least one characteristic of said first oscillating voltage signal;

transformer means responsive to said first oscillating voltage signal for generating a second oscillating voltage signal of higher amplitude therefrom;

rectifier means for converting said second oscillating voltage signal into a second DC voltage signal;

means for providing said feedback signal in accordance with said second DC voltage signal and for applying said feedback signal to said converting means, said feedback signal causing said converting means to adjust said characteristic of said first oscillating voltage signal such that said second DC signal remains substantially constant at a value substantially greater than said DC voltage signal from said battery; and,

means for applying said second DC signal to said electrically operated fuel injectors, said means for applying said second DC signal including actuatable switch means connected to said fuel injectors and having an input directly connected to said substantially constant, second DC voltage signal for, when said switch means is actuated, connecting said substantially constant, second DC voltage signal to said electrically operated fuel injectors to thereby cause fuel to be injected into said engine and means for actuating said switch means.

4,576,136
FUEL DISPENSER FOR INTERNAL COMBUSTION ENGINE

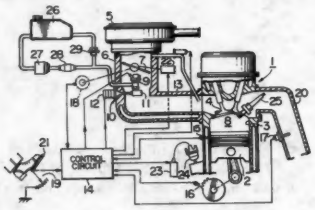
Teruo Yamauchi, Katsuta; Toshiharu Nogi, Hitachi, and Yoshishige Oyama, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 716,942

Claims priority, application Japan, Mar. 28, 1984, 59-58484; Jul. 26, 1984, 59-156352

Int. Cl.[4] F02M *29/00*

U.S. Cl. 123—590 **13 Claims**



1. A fuel dispensing device used in an internal combustion engine comprising:

throttle valve means;

a sensor for detecting an operational state of the engine;

a control circuit which produces an engine control signal based on the output of said sensor;

an even number of intake tubes connected to an intake passage on the downstream side of said throttle valve means, with each of said tubes branching at the downstream end thereof into two parts that are connected to two cylinders of the engine;

at least one atomizer provided for at least a pair of said intake tubes, said atomizer comprising a pair of cylindrical atomizer rings disposed in said intake tube pair and a driver for driving said atomizer ring pair in response to the control signal from said control circuit; and

an even number of injection valves each provided for each of said atomizer ring so as to inject fuel onto the interior wall of said atomizer ring through a hole formed in the wall of said atomizer ring, so that the fuel is atomized by the vibration of said atomizer rings, while intermixing with air, and delivered to respective cylinders.

4,576,137
GAS-DIESEL DUAL FUEL ENGINE

Mitsuo Tanaka, Ibaraki, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Division of Ser. No. 389,093, Jun. 16, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 757,072

Claims priority, application Japan, Jun. 19, 1981, 56-89486[U]; Jun. 19, 1981, 56-89487[U]; Jun. 19, 1981, 56-89488[U]; Jun. 19, 1981, 56-89489[U]; Jun. 19, 1981, 56-89490[U]

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—575 **3 Claims**

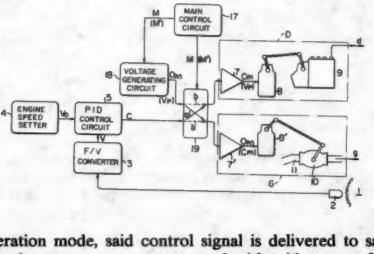
1. In a gas-diesel dual fuel engine apparatus having a diesel engine, a diesel fuel supply system including a diesel fuel injection pump, a gaseous fuel supply system including a gaseous fuel regulating valve, and a governing and controlling device for governing the speed of said engine through the control of fuel supplied to said engine and controlling the switchover of the operation of said engine between a diesel fuel mode and a gaseous fuel mode; the improvement that said governing and controlling device comprises:

(a) at least one electronic governor means adapted to compare a speed signal representing the actual operating speed of said diesel engine with a set speed signal representing the set speed thereof and to perform a proportional plus integral plus differential operation on the basis of the difference therebetween for outputting a control signal according to the difference between said two speed signals;

(b) a pair of electric actuator means having respective power amplifier circuits and mechanically connected to said diesel fuel injection pump and said gaseous fuel regulating valve, respectively, for the actuation thereof;

(c) mode switching control means for controlling the switchover of said governing and controlling device between the engine's diesel fuel operation mode and gaseous fuel operation mode, said mode switching control means being adapted to generate command signals for fully closing said gaseous fuel regulating valve when the engine is in the diesel fuel operation mode and for operating said diesel fuel injection pump to feed said diesel engine with a predetermined amount of a diesel fuel as pilot injection fuel when the engine is in the gaseous fuel operation mode; and

(d) signal selecting means connecting said electronic governor means and said mode switching control means to said pair of electric actuator means for selectively delivering said control signal and said command signals, said signal selecting means being controlled by said mode switching control means so that when the engine is in the diesel fuel operation mode, said control signal is delivered to said electric actuator means connected with said diesel fuel injection pump to operate said pump and a command signal is delivered to said electric actuator means connected with said gaseous fuel regulating valve to close said valve, while when the engine is in the gaseous fuel



operation mode, said control signal is delivered to said electric actuator means connected with said gaseous fuel regulating valve and a command signal is delivered to said electric actuator means connected with said diesel fuel injection pump to operate said pump for the pilot injection;

(e) said mode switching control means comprising a main control circuit, a voltage generating circuit adapted to receive an instructional signal from said main control circuit to generate any desired voltage for said command signals, and a mode switching circuit connected to said voltage generating circuit and said main control circuit and serving as said signal selecting means, said electronic governor means including a PID control circuit adapted to generate said control signal according to the difference between said speed signal and said set speed signal, said pair of power amplifier circuits being connected to receive the control signal from said PID control circuit through said mode switching circuit, one of said power amplifier circuits being operable in response to an input from said mode switching circuit to produce an output for driving said electric actuator means for said fuel injection pump, and the other power amplifier circuit being operable in response to a different input from said mode switching circuit to produce an output for driving said electric actuator means for said gaseous fuel regulating valve, said mode switching control means being adapted, when the engine is in the diesel fuel operation mode, to deliver the control signal from said PID control circuit to said power

amplifier circuit associated with said diesel fuel injection pump while leading the output of said voltage generating circuit, after converting said output of said voltage generating circuit into zero volt, to said power amplifier circuit associated with said gaseous fuel regulating valve, and said mode switching control means being further adapted, when the engine is in the gaseous fuel operation mode, to deliver the control signal from said PID control circuit to said power amplifier circuit associated with said gaseous fuel regulating valve while delivering the output from said voltage generating circuit, after converting said output of said voltage generating circuit into a voltage proportional to the rate of pilot injection of diesel fuel, to said power amplifier circuit associated with said diesel fuel injection pump.

4,576,138

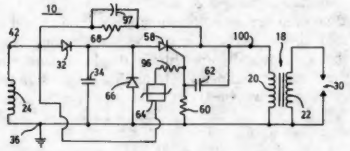
CAPACITOR DISCHARGE IGNITION SYSTEM WITH IMPROVED CONTROL CIRCUIT

Ronald J. Wolf, Zanesville, Ind., assignor to Wabash, Inc., Huntington, Ind.

Continuation of Ser. No. 488,212, Apr. 25, 1983, abandoned, and a continuation-in-part of Ser. No. 382,679, Mar. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 331,293, Dec. 16, 1981, abandoned. This application Jul. 12, 1985, Ser. No. 755,208

Int. Cl.⁴ F02P *5/145*

U.S. Cl. 123—600 **36 Claims**



1. In a capacitor discharge ignition system for use with and positioned adjacent a rotating magnetic field in synchronism with the operation of an engine the combination of:

means for generating a charging supply and for generating a triggering supply in response to induced voltages and currents resulting from the rotating magnetic field, said charging supply and said triggering supply including a respective charing voltage waveform and a triggering voltage waveform having increased amplitudes in accordance with increased engine speed, said generating means comprising a control winding;

storage means connected to said generating means and being charged in response to said charging supply for storing said energy delivered from said charging supply;

ignition coil means for receiving energy and for generating an ignition voltage in response to said received energy; and

means responsive to said storage means and said generating means for controlling the discharge of said storage means into said ignition coil means, said discharge controlling means comprising control circuit means and electronic switch semiconductor means having anode, cathode and control connections, said anode being connected to said storage means and said cathode being connected to said ignition coil means, said control circuit means comprising controlled conduction means connected between said control connection and a first end of said control winding, a resistor connected between said cathode and said first end of said control winding, a resistor connected between said control connection and a second end of said control winding, a capacitor connected between said control connection and said cathode connection, said control circuit means providing a predetermined change in ignition timing characteristics when the speed of the engine exceeds a predetermined speed and said charging voltage exceeds a predetermined voltage; wherein said predetermined change in ignition timing characteristics is an abrupt advance in ignition timing when said predetermined speed is exceeded, wherein said generating means further generates a second triggering supply, said second triggering supply being generated before said charging supply, said triggering supply being generated after said charging supply, said electronic switch semiconductor means being rendered conductive by said second triggering supply for engine speeds exceeding said predetermined engine speed and being rendered conductive by said triggering supply for engine speeds less than said predetermined engine speed.

4,576,139

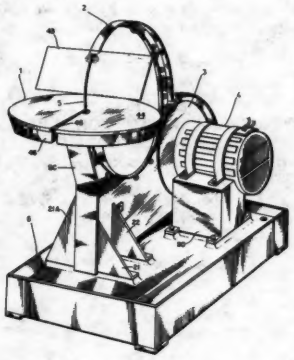
RIGID WIRE SAW WHEEL APPARATUS FOR VERY HARD MATERIALS

Jesse G. Cogswell, 2823 Main St., Santa Monica, Calif. 90405

Filed May 6, 1985, Ser. No. 730,869

Int. Cl.⁴ B28D *1/08*

U.S. Cl. 125—21 **13 Claims**



1. Aparatus for sawing particularly hard materials, such as glass, ceramics, refractories and stone, the apparatus comprising:

(a) a base;

(b) a back-plate assembly mounted on said base, said back-plate assembly comprising a back-plate, front support struts and side support struts, a face shield assembly, water tray bracket supports, horizontal roller-guides and a plurality of saw-guides, said back-plate assembly acting as a splatter shield and providing operator safety protection;

(c) a rigid circular wire saw comprising a single strand of high tensile strength metal and coated with fixedly secured bonded super-abrasive particles such as diamonds, cubic boron nitride and mixtures thereof, said rigid circular wire saw being mounted on said back-plate assembly and guided by said saw-guides, so that when being rotated at its operating high speed, said rigid circular wire saw will abrade a workpiece brought into abrading contact therewith;

(d) means for driving said rigid circular wire saw, causing it to rotate at high speed;

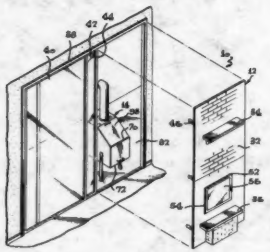
(e) a motor assembly;

(f) means for wetting and cooling said rigid circular wire saw, providing a surface for supporting and locating the workpiece.

4,576,140
ASH CATCHER FOR CHARCOAL GRILL
Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.
Filed Jul. 8, 1985, Ser. No. 752,948
Int. Cl.[4] A47J 37/00
U.S. Cl. 126—25 R 4 Claims

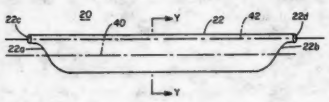
1. A portable grill including a spherical bowl having three supporting legs arranged in a tripod configuration and an ash catcher supported by said legs, said ash catcher comprising a circular disk having a peripheral edge engaging inner surfaces of said legs and a plurality of adjustable clips supported on said legs and having portions extending under and engaging a lower portion of said circular disk so that said circular disk is held in a wedged position in said tripod leg configuration by said adjustable clips.

4,576,141
FIREPLACE APPARATUS FOR SLIDING DOOR APERTURE
Robert M. Lillard, 3708 Watseka Ave., #316, Los Angeles, Calif. 90034
Filed Jan. 17, 1985, Ser. No. 692,215
Int. Cl.[4] F24B 1/18
U.S. Cl. 126—120 5 Claims



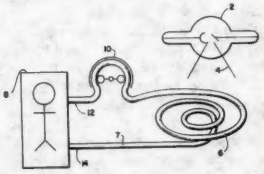
1. A fireplace apparatus comprising in combination:
a panel, said panel being substantially flat and being sized to be removably positioned within a sliding door aperture, said panel having a panel opening therein;
a firebox comprising a substantially closed box having a front opening therein, said firebox being positionable with respect to said panel so that said front opening in said firebox is in substantial alignment with said panel opening so that the interior of said firebox can be viewed through said panel and front openings, said firebox including a lower door for removably positioning over said front opening and including an upper door positioned above said lower door for access to the upper part of the interior of said firebox, said upper door being angularly oriented with respect to the vertical; and means for supporting said firebox so that it is removably positioned with said panel and front openings in substantial alignment.

4,576,142
PERCUTANEOUS INTRA-AORTIC BALLOON AND METHOD FOR USING SAME
Peter Schiff, Rte. 7, Cookeville, Tenn. 38501
Filed Nov. 19, 1982, Ser. No. 442,958
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—1 D 34 Claims



1. A balloon assembly adapted for facilitating insertion in a vessel comprising:
an elongated catheter tube;
an elongated balloon having a proximal end joined to one end of said catheter tube and having an opposite, distal end terminating in a tip;
a stylet having a distal end terminating in said tip and extending through said balloon and into said catheter tube;
said balloon comprising a sleeve having a tapered distal and proximal end respectively joined to said tip and said catheter tube;
said balloon assuming an annular cross-section when uninflated and being generally symmetric about an imaginary longitudinal axis; and
said tapered distal and proximal ends joining said balloon to said tip and said catheter tube and aligning said stylet so that said stylet is substantially displaced from the longitudinal axis of said balloon to facilitate tight wrapping of the balloon about said stylet.

4,576,143
METHOD OF IMMUNE MODIFICATION BY MEANS OF EXTRACORPOREAL IRRADIATION OF THE BLOOD
William T. Clark, III, No. 6 Davis Blvd., New Orleans, La. 70121
Filed Oct. 5, 1984, Ser. No. 658,436
The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.
Int. Cl.[4] D61M 1/03
U.S. Cl. 128—1 R 3 Claims



1. A method for immune modification in a human patient having symptoms of a disorder of the immune system characterized by the presence of lymphocytes which are not appropriately activated which comprises:
deactivating those lymphocytes which are not appropriately activated by passing the patient's blood through an extracoporeal link, and irradiating it while in transit through the link with a transit dose to render the not appropriately activated lymphocytes inactive but less than that required to significantly diminish the patient's lymphocyte count, and continuing such irradiation until a different lymphocyte population emerges, which different lymphocyte population is characterized by lymphocytes which have

not been inappropriately activated, said irradiation continuing until the symptoms of the disorder have subsided, and further continuing the aforesaid irradiation of the patient's blood if the symptoms of disorder reappear.

4,576,144

ENDOSCOPE CONNECTING DEVICE

Fumiaki Ishii, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 470,603, Feb. 28, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 724,938
Claims priority, application Japan, Mar. 8, 1982, 57-36004
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **6 Claims**

1. A connecting device for selectively connecting a first endoscope and a second endoscope to the same socket of a power source mechanically and electrically, said first endoscope having a connector including contact pins projecting at an end recessed surface thereof in a direction in which the pins can be inserted into the socket and said second endoscope having a connector with a flat end surface and including contact pins projecting at an outer peripheral surface thereof comprising:

a first adapter constructed such that it is capable of mechanically being connected to the connector of said second endoscope; and

a second adapter constructed such that it is capable of being connected to the socket of said power source, said second adapter being also constructed such that it it capable of being selectively connected to said connector of said first endoscope and said connector of said second endoscope with said first adapter thereon mechanically and electrically, said second adapter being formed in a cylindrical shape and comprising a body capable of receiving therein said first adapter and the connector of said second endoscope; and

said second adapter comprises first terminal boards elastically projecting from inner peripheral surfaces thereof and located to be electrically connected to the contact pins of said second endoscope when said second adapter is connected to said second endoscope and second terminal boards elastically projecting from inner peripheral surfaces of said second adapter electrically connected to said first terminal boards; and said first adapter comprises a cylinder having an outer diameter substantially smaller than the inner diameter of said second adapter, first terminal pins projected from the outer peripheral surface of the cylinder to be electrically connected to said second terminal boards of said second adapter when said second adapter is connected to said first adapter and second terminal pins projected from one end surface of the cylinder electrically connected to said first terminal pins of said first adapter to be electrically connected to the socket when said second adapter is connected to said socket and first adapter; and

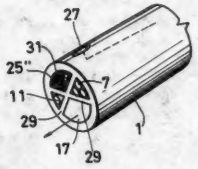
the body of said second adapter comprises a plurality of guide grooves formed on the inner peripheral surface thereof and extending along an axial direction, the first terminal pins of said first adapter being slidable along the guide grooves in the grooves upon insertion of the first adapter into the second adapter, and the second terminal boards of said second adapter projecting into the guide grooves.

4,576,145

FIBERSCOPE

Koichi Tsuno, and Akira Nishimura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 22, 1984, Ser. No. 582,517
Claims priority, application Japan, Feb. 22, 1983, 58-27875
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **3 Claims**



1. A fiberscope adapted to be inserted into a passage through which an opaque liquid passes for observing the interior of said passage, comprising: a flexible tube; a first optical fiber passing through said flexible tube for carrying illuminating light from a light source to an object to be observed, said flexible tube having plural passages defined by longitudinally extending partitioning walls formed interior to said flexible tube; a second optical fiber for carrying image light reflected from said object to image viewing means; and liquid guiding passage means for guiding a transparent flushing liquid to a tip of said tube; an inflatable balloon provided rearwardly of said tip of said tube surrounding a portion of an outer wall of said tube; and fluid passage means for providing an inflating fluid to said balloon, said fluid passage means being disposed in said tube and communicating with said balloon, said fluid passage means comprising one of said plural passages.

4,576,146

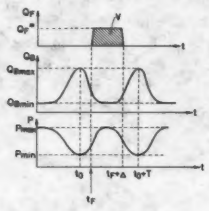
FIBERSCOPE

Chisato Kawazoe; Kenichi Yoshida, and Koichi Tsuno, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 22, 1984, Ser. No. 592,210
Claims priority, application Japan, Mar. 22, 1983, 58-48205
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **8 Claims**

1. In a fiberscope for conducting observations in a region ordinarily filled with an opaque liquid and including a fiber bundle comprising an image transmitting image fiber having an optical system at a forward end thereof for forming an image of an object under observation and illuminating light transmitting light guides arranged beside said image fiber; a cover tube covering said fiber bundle; and a liquid passageway formed between an inner wall of said cover tube and outer surfaces of said fiber bundle, the improvement comprising: means for

injecting transparent liquid from a hole near the end of said fiberscope at a flow rate in synchronization with variations in



a flow rate of said opaque liquid to temporarily displace some of said opaque liquid, thereby to permit observation.

4,576,147

HARD ENDOSCOPE WITH IMPROVED LIGHT DISPERSION

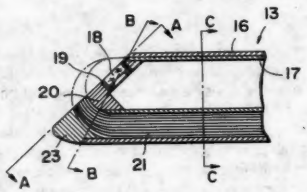
Toshihiko Hashiguchi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 395,662, Jul. 6, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 634,673

Claims priority, application Japan, Jul. 16, 1981, 56-111448

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. A hard endoscope, comprising:

a hard outer tube having an inner peripheral surface;

an inner tube disposed eccentrically within said outer tube such that said inner tube contacts a portion, defined as the upper portion, of said inner peripheral surface of said outer tube, thereby forming a cresent-shaped space in cross-section, between the inner peripheral surface of said outer tube and the outer surface of said inner tube,

an observing optical system disposed within said inner tube;

a plurality of light guide fibers disposed within said space for transmitting light therealong;

a tip surface for emitting and receiving light, said tip surface disposed on a tip part formed by the inner and outer tubes, said tip part having an eliptical upper surface and a visual field direction forward of said tip surface;

an end portion of said inner tube disposed at the tip part, said end portion having a curved outer surface in contact with said light guide fibers;

an end portion of said outer tube disposed at the tip part, said end portion having at its lower side, diametrically opposite the upper portion of the tube, an inner curved surface in contact with said light guide fibers; and

a saddle-shaped pressing part disposed in between said inner and outer tubes at the upper portions thereof and near said tip part, said pressing part having edges for pressing said light guide fibers together in the circumferential direction with respect to said inner tube, such that said light guide fibers are concentrated in the visual field direction.

4,576,148

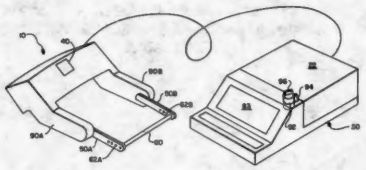
CONTINUOUS PASSIVE MOTION HAND DEVICE

Richard J. Koerner, Encinitas; Christopher C. Dumas, San Diego; Philip J. Filia, San Diego; Ronald L. Lawrence, San Diego, and David B. Petch, San Diego, all of Calif., assignors to Sutter Biomedical, Inc., San Diego, Calif.

Filed Feb. 3, 1984, Ser. No. 576,592

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—26 **23 Claims**



1. A device for providing continuous passive motion therapy to one or more fingers of a patient's hand including drive means carried on the patient's hand or arm including drive gear means extending at least partially down the side of the patient's hand

and drive arm means coupled to said drive gear means and to at least one finger of the patient's hand for causing flexion and extension of the finger joint with rotation of said drive gears.

4,576,149

MASSAGER

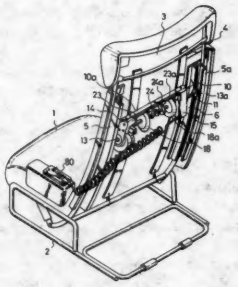
Shinpei Otuka, Hikone; Kozo Kawai, Hirakata, and Toshio Kusunoki, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 29, 1984, Ser. No. 626,384

Claims priority, application Japan, Jul. 20, 1983, 58-132200

Int. Cl.[4] A61H *1/00*; A47C *7/62*

U.S. Cl. 128—33 **3 Claims**



1. A massager comprising:

a supporting frame,

a reversible rotary driving source supported by said supporting frame,

a shaft means including a main shaft and a driving shaft, said main and driving shafts rotatably supported by the supporting frame for independent rotation,

a pair of massaging wheels mounted eccentrically and symmetrically slanted on said main shaft to be rotatable with said main shaft and shiftable relative to each other in the axial direction of said main shaft,

first drive transmitting means for transmitting rotary drive power from said driving source to said main shaft to rotate said main shaft and said eccentric massaging wheels such

that said wheels move toward a user's body to a proximate position, and away from a user's body to a remote position,

spacing-varying means connected with said first drive transmitting means and said massaging wheels for varying the spacing between said massaging wheels by shifting them relative to each other on said main shaft between minimum and maximum spacing positions, during rotation of said main shaft,

displacement means coupled to end portions of said driving shaft for displacing said shaft means perpendicularly to the longitudinal axes of said main and driving shafts between two extreme positions, in response to rotation of said driving shaft,

second drive transmitting means for transmitting rotary drive power from said driving source to said driving shaft for effecting said displacement of said shaft means,

control means for controlling the positions of said shaft means and said massaging wheels, comprising:

first detecting means for detecting the spacing of said massaging wheels between said minimum and maximum spacing positions,

second detecting means for detecting the position of said shaft means between said two extreme positions,

third detecting means for detecting the position of said massaging wheels between said remote and proximate positions,

means connected to said first detecting means and said first drive transmitting means for actuating the latter in response to a termination of a massaging operation for moving said massaging wheels to said remote position,

means connected to said second detecting means and said second drive transmitting means for actuating the latter in response to a termination of a massaging operation for displacing said shaft means to one of said extreme positions,

means connected to said third detecting means for said spacing-varying means for actuating the latter in response to a termination of a massaging operation for shifting said massaging wheels to said minimum spacing position, and

means connected to said first detecting means and said first drive transmitting means for actuating the latter in response to an initiation of a massaging operation for moving said massaging wheels to said proximate position.

4,576,150

ORTHOPAEDIC SUPPORT FOR THE HEAD AND NECK

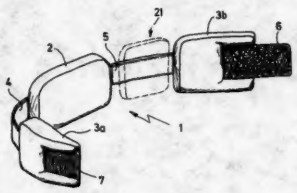
Walter Auracher, Colmarer Strasse 45, 7000 Stuttgart 40, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,649

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308571

Int. Cl.⁴ A61H *1/02*

U.S. Cl. 128—75 **3 Claims**



1. An orthopaedic support for the head and neck of a patient comprising a chin pad element having a face for engaging the wearer's neck in the chin region thereof, a nape pad element for engaging the wearer's neck in the nape region thereof, each of said chin and nape pad elements being so dimensioned as to engage the wearer's neck over substantially the entire height thereof, a pair of flexible tapes attached to said chin and nape pad elements for holding said chin and nape elements in spaced relationship when said support is in operative position on a patient's neck, said tapes being narrower than the height of the patient's neck, said tapes bridging the spaces between said chin and nape pads, releasable fastener elements for releasably holding said support in said operative position, and additional pad elements detachably connected to the portions of said tapes bridging said spaces between said chin and nape pad elements.

4,576,151

ORTHOPEDIC LEG APPLIANCE

Hoagy C. Carmichael, Box 877, Whitefish, Mont. 59937, and Miles R. Schooler, 250 Brenner Rd., Columbia Falls, Mont. 59912

Filed Mar. 19, 1984, Ser. No. 591,502

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 C **20 Claims**

1. An orthopedic leg appliance mountable to a patient's legs adjacent the knees, for applying rotational forces to at least one of the legs, the appliance comprising:

first leg cuffs mountable to the patient's upper legs adjacent to the knees;

second leg cuffs mountable to the patients lower legs;

means interconnecting the first and second cuffs to form two cuff pairs with each cuff pair including one first cuff and one second cuff;

a cross member joining the cuff pairs;

breakaway hinge means on the cross member selectively operable for:

(a) releasing the cuffs to pivot relative to one another about a midsagittal pivot axis between inoperative positions wherein the cuff pairs are positioned to facilitate application or removal of the cuffs to or from the patient's legs and operative positions wherein the cuffs are positioned to apply corrective torsional forces to at least one of the patient's legs; and

(b) locking the cuff pairs in their operative positions; and

adjustable torsion means on the cross member operatively engaging at least one of the cuffs for selectively rotating the one cuff to apply corrective torsion to the patient's leg on which the one cuff is mounted.

4,576,152

INJECTOR FOR BONE CEMENT

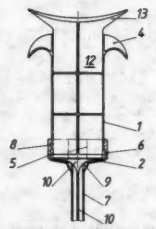
Maurice E. Müller, Berne, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 18, 1983, Ser. No. 543,238

Claims priority, application Switzerland, Oct. 21, 1982, 6118/82

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 R **8 Claims**



1. An injector for an expandable bone implant cement, said injector comprising

a cylinder tube for receiving bone cement, said tube having a bottom and an injection nozzle in said bottom for expelling bone cement therethrough;

a piston movably mounted in said tube for displacing bone cement in said tube through said injection nozzle;

a nozzle element secured to and extending from said tube, said nozzle element having a nozzle tube aligned with and of smaller cross-section than said injection nozzle to pass bone cement therethrough; and

a ram movably mounted in said nozzle tube to eject bone cement therefrom.

4,576,153

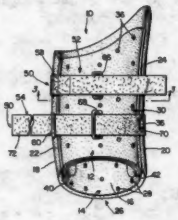
BOWED UPPER ARM BRACE

Joseph Zagorski, 355 Marquesa Dr., Coral Gables, Fla. 33156, and Alan Finnieston, 2480 W. 82nd St., Hialeah, Fla. 33016

Filed Feb. 13, 1984, Ser. No. 579,543

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—87 R **5 Claims**



1. An upper arm brace for maintaining broken bones segments in an acceptable healing orientation by protecting and reinforcing the surfaces of the upper arm of the wearer between the shoulder zone and the elbow zone, said brace comprising:

an elongate, generally U-shaped posterior member having a base and sidewalls extending around the posterior surface of the upper arm, said sidewalls being bowed inwardly toward the body of the wearer; and

an elongate generally C-shaped anterior member having a base and sidewalls extending around the anterior surface of the upper arm, said sidewalls being bowed inwardly to mate with the sidewalls of said posterior member with the longitudinal side edges of said anterior member being disposed in overlapping relationship with the longitudinal side edges of said posterior member whereby said anterior and posterior members encase the upper arm with the inner surfaces of said anterior and posterior members being in contact with the surface of the upper arm;

said anterior and posterior members being made of a semi-rigid material with said sidewalls of said members capable of being flexed whereby said broken bone fragments are urged toward an acceptable healing orientation by a slight valgus force.

4,576,154

SACROILIAC BELT

Alan A. Hyman, 2800 N. Sheridan Rd., #610, and Julie E. Goldberg, 3930 N. Pine Grove, both of Chicago, Ill. 60657

Filed Apr. 2, 1984, Ser. No. 595,590

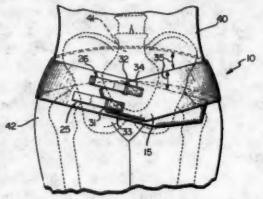
Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **1 Claim**

1. A belt for easing sacroiliac pain or discomfort in a patient, said belt comprising:

a uniform band of flexible, flat, washable, inelastic, woven fiber webbing material, being generally about 4 to 6 inches in width and having opposite ends spaced apart by a length sufficient to encircle the pelvis of said patient, and wherein the width of said band at each of said ends is tapered at an acute angle to reduce exposure of the free corners at the ends of said band,

fastening means comprising at least two hook and loop type pad fasteners, each hook and loop type pad fastener being provided with a strap at one end of the fastener and a buckle at the other end of the fastener whereby each strap is attached to the band parallel to the longitudinal axis of the belt and is inset at a distance from one end of the band sufficient to allow overlapping support in the abdominal region of the user and whereby each buckle is attached substantially at the opposite end of the band at said acute angle to the longitudinal axis of the belt to allow the band to pass horizontally across the patient's pelvis for maintaining compression by the band of the soft tissues of the pelvis firmly against the sacrum, ilium, and coccyx bones



of the patient when said straps are passed from one end of said band through the buckle and back upon themselves to be adjustably fastened to themselves with the hook and loop pad fasteners,

whereby pain or discomfort in the sacroiliac joint of the human patient may be relieved by a method comprising the steps:

extending the center of said belt horizontally across said patient at the pelvis outwardly of the sacrum,

wrapping the ends of said band about the patient at his pelvis,

applying sufficient tension to said band at the ends thereof to compress the soft tissue of the pelvis of the patient against the sacrum and ilium to support and substantially immobilize them against relative movement, and

joining the ends of the bands together at the front of the patient at an angle to maintain said tension and placement.

4,576,155

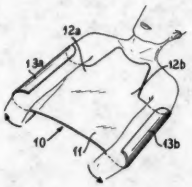
EXTERNAL PULMONARY BRACE AND METHOD FOR USING SAME

Aaron I. Levy, Chicago, Ill., assignor to Thomas G. Baffes, Skokie, Ill., a part interest

Filed Nov. 9, 1983, Ser. No. 549,880

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—132 R **6 Claims**



1. An external brace for use by a patient for applying user-controlled pressure to a section of the patient's body comprising:

a pair of spaced brackets respectively surrounding the patient's triceps;

a central section consisting of elastic flexible material connected to each of and spanning the distance between said brackets, and extending across such substantially covering said body section to which pressure is to be applied;

means connecting opposite sides of said central section to said spaced brackets;

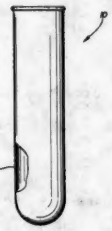
and said brackets and said central section being relatively disposed for applying selected pressure by the patient to said body section by effecting arm movement in a downward direction away from the patient's body pivoting the arms at the patient's body pivoting the arms at the patient's shoulders.

4,576,156

PROPHYLACTIC DEVICE AND METHOD

Manfred F. Dyck, Somerville, and Walter A. Haine, Bridgewater, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Apr. 17, 1978, Ser. No. 896,844
Int. Cl.[4] A61B *19/00*; B29D *51/00*
U.S. Cl. 128—132 R **7 Claims**



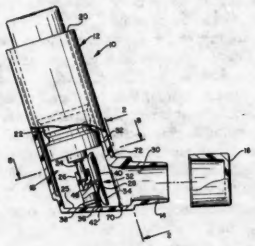
1. The method of preparing a prophylactic device comprising a thin body of substantially homogeneous elastomeric theremoplastic polyurethane material having a substantially cylindrical principal portion which is closed at one end, said cylindrical portion providing a wall of substantially uniform thickness, which method comprises deforming a sheet of a thermoplastic polyurethane elastomer with a preformed mandril at an elevated temperature, whereby said polyurethane elastomer assumes the shape of said mandril forming a polyurethane prophylactic device having a substantially cylindrical principal portion and a wall of substantially uniform thickness.

4,576,157

ORAL INHALATION APPARATUS

Puthalath K. Raghuprasad, 315 N. Golder, Suite A, Odessa, Tex. 79761

Filed Oct. 24, 1983, Ser. No. 544,777
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—200.23 **13 Claims**



1. An inhaler apparatus having a main housing, a canister of treatment fluid removably mounted within said main housing, said canister has an outlet means through which treatment fluid can flow; a valve means, means supporting said valve means within said main housing at a location downstream of said canister, said valve means is connected to the canister outlet means for regulating flow of treatment fluid therefrom;

said valve means includes a valve element, a said means supporting said valve means includes a standpipe attached to said housing, said standpipe having a hollow upper marginal inlet end within which said outlet means of said canister is received, with there being an outlet nozzle communicating with said hollow upper end through which treatment fluid can flow when said valve means is opened; said nozzle being oriented in the direction of said mouthpiece to form a mixture of air and treatment fluid within said mouthpiece; said valve means includes a sail and a needle valve connected to said nozzle for throttling flow through said nozzle in accordance with the magnitude of the pressure drop across the sail, and means associated with said sail for actuating said valve means from a closed to the open position in response to pressure differential effected across said sail; means providing a source of ambient air upstream of said sail;

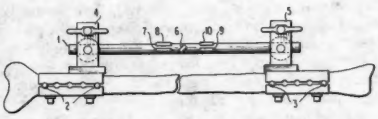
a mouthpiece connected to said housing at a location downstream of said valve means, said sail being arranged transversely to the direction of flow through said mouthpiece so that when the mouthpiece is placed in one's mouth and a breath of air is taken through said mouthpiece, said sail is forced to move in a downstream direction thereby opening said valve means an amount which is proportional to the pressure differential effected across the sail.

4,576,158

METHOD FOR DETERMINING THE STABILITY OF AN ORTHOPEDIC DEVICE COMPOSED OF AN EXTERNAL FIXATION BAR DURING SETTING OF BONE FRACTURES

Michel A. G. Boland, Ham-sur-Heure, Belgium, assignor to Region Wallone, Brussels, Belgium

Filed Jan. 10, 1984, Ser. No. 569,558
Claims priority, application Belgium, Jan. 28, 1983, 895728
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 R **2 Claims**



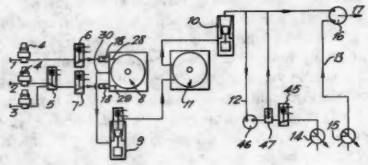
1. A method for determining the stability of an orthopedic assembly produced by means of an external fixation, characterized by the use of a fixation bar connected by clamps to pins within bone fragments provided with five assemblies of strain gauges having at least one gauge each; said method comprising the steps of measuring the torsion of the bar via one of said five assemblies, measuring two perpendicular components of the bending of the bar at two points of said bar via the remaining two pairs of said assemblies, and determining by means of said strain gauges the amount of the torsion and the amount of the bending at the level of the clamps which connect the fixation bar to the pins, and by the comparison of the determined levels of torsion and bending with those capable of causing sliding in the clamps, determining the extent of stability of said orthopedic assembly.

4,576,159

GAS MIXING AND FLOW SMOOTHING APPARATUS

Clive E. W. Hahn, Oxon; Eileen Palayiwa, Oxford; David J. Lindsay-Scott, Oxon; Basil R. Sugg, Oxford, and Paul J. Tyrrell, Oxon, all of England, assignors to Penlon Limited, England

Filed Feb. 23, 1984, Ser. No. 582,912
Claims priority, application United Kingdom, Feb. 24, 1983, 8305117
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.14 20 Claims



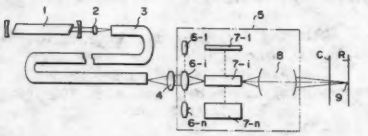
1. Apparatus for mixing and smoothing fluctuating flows of two or more gases, comprising a mixing chamber with at least two inlet ducts and an outlet duct, means for delivering a fluctuating flow of gas to each of said inlet ducts, the mixing chamber including means for absorbing fluctuations in the pressure of the gases therein, and a valve connected to said outlet duct downstream of the chamber for maintaining a substantially constant pressure at said chamber outlet duct.

4,576,160

PHOTOTHERAPEUTIC APPARATUS WITH SPOT SIZE REGULATING MEANS

Shinya Tanaka, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,330
Claims priority, application Japan, Jul. 15, 1982, 57-123398
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—303.1 7 Claims



1. A phototherapeutic apparatus comprising:

a therapeutic light source for projecting light beams of a selected spot size onto a therapeutic region of a patient;

spot size regulating means located between said light source and the therapeutic region for regulating the spot size of the light beams projected onto the therapeutic region;

said regulating means including coarse regulating means for effecting a coarse stepwise change in the spot size and fine regulating means for effecting a fine adjustment in the spot size;

said coarse regulating means being provided adjacent said light source and including a plurality of illuminating fiber optical elements having different emitting end diameters respectively and means for selecting one of said fiber optical elements so that the light beams from said light source are passed through and emitted from the emitting end of the selected one of the fiber optical elements, whereby said emitting end of said selected fiber optical element functions as a secondary light conduit whose size is determined by the diameter of said emitting end;

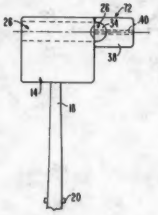
said fine regulating means being located between said coarse regulating means and the therapeutic region and including a variable magnification optical system for projecting and imaging the light beams from said emitting end of the selected one of the fiber optical elements onto the therapeutic region, said magnification optical system having a range of magnification change which is sufficient to substantially cover the differences between emitting end diameters of the fiber optical elements which are adjacent to each other.

4,576,161

INSTRUMENT FOR USE IN OBSTRUCTING THE VAS DEFERENS

Vernon E. Mikkelson, 27001 Calaroga Ave., Hayward, Calif. 94545

Filed Mar. 22, 1984, Ser. No. 592,136
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R 10 Claims



1. An instrument for use in performing a vasectomy comprising:

a pair of clamp members; and

means coupled to the clamp members for moving the same into and out of positions adjacent to each other, said clamp members having means defining an elongated space when the clamp members are in said positions, said space having a shape adapted to receive and to confine an elongated portion of the scrotum containing the vas deferens, one of the clamp members having means for guiding a hypodermic needle into and longitudinally of the space and into the scrotum portion and the vas deferens when the scrotum portion is in the space.

4,576,162

APPARATUS AND METHOD FOR SEPARATION OF SCAR TISSUE IN VENOUS PATHWAY

Charles E. McCorkle, 1427 E. Bayview Dr., Tempe, Ariz. 85283

Continuation-in-part of Ser. No. 480,412, Mar. 30, 1983, Pat. No. 4,471,777. This application Sep. 17, 1984, Ser. No. 651,438
Int. Cl.[4] A61B *17/50*
U.S. Cl. 128—303 R 14 Claims

8. An apparatus for passing a lead extraction apparatus over an endocardial lead extending through a venous path and surrounded by scar tissue that impedes advancement of said lead extraction apparatus through said venous path to a tip of said endocardial lead lodged in scar tissue in the heart of a patient, said apparatus comprising:

(a) lead grasping means for grasping a portion of said endocardial lead to secure it to said lead grasping means;

(b) cannula means having a distal end and a proximal end and concentrically disposed about said lead grasping means for controlled advancement into said venous path along said lead grasping means and said endocardial lead, and a first catheter having a distal end connected to said proximal end of said cannula means and a proximal end controllable from outside of said venous path;

(c) locking means connected to said cannula means for releasably engaging said endocardial lead to lock said cannula means to said endocardial lead means; and

(d) shearing cylinder means having a distal end and a proximal end disposed concentrically about said first catheter and having a plurality of pointed teeth extending from said distal end of said shearing cylinder means toward said

distal end of said cannula means for controlled advancement over said cannula means to separate scar tissue into which said distal end of said cannula means is advanced, said advancement of said shearing cylinder means over said canula means causing said locking means to lock said cannula means to said endocardial lead and thereby causing said endocardial lead to present said advancement of said shearing cylinder means from pushing said scar tissue

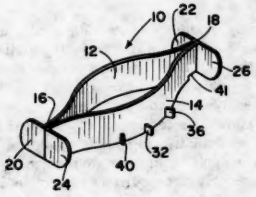
and endocardial lead further into said venous path and thereby causing said teeth of said shearing cylinder means to separate said scar tissue to form a pathway through said scar tissue through which said cannula means can be further advanced, and a second catheter having a distal end connected to said proximal end of said shearing cylinder means and a proximal end controllable from outside of said venous path.

4,576,163

SKIN MARKER FOR USE IN BIOPSY EXCISIONS

Robert J. Bliss, 925 W. H St., Jenks, Okla. 74037

Filed Aug. 8, 1983, Ser. No. 521,334
Int. Cl.[4] A61F *17/32*
U.S. Cl. 128—305 3 Claims



1. A skin marker for surgical purposes, comprising a hollow member of material sufficiently rigid to leave a marking on the skin of a patient after being pressed edgewise thereagainst,

said members being formed of a pair of initially flat blanks disposed on edge with their ends secured tightly together and each blank being outwardly bowed centrally thereof to define a bottom edge having an excision pattern converging to a point at each end from a widened central area to leave a defect after incision that may be closed to provide a fine line straight scar,

each blank of said pair being a mirror image of each other with each blank having at least one suture guide marker extending outwardly of each blank, the bottom edge of said marker being in the same plane as said bottom edge of said blank.

4,576,164

KNIFE WITH LOCKING SHROUD

W. George Richeson, 182 Mountain Brook Dr. NW., Marietta, Ga. 30064

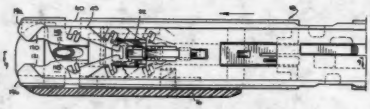
Filed Nov. 14, 1983, Ser. No. 551,344
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 4 Claims

1. A microsurgical knife, said knife including an elongate knife body, a cutting blade extending from one end of said knife body, and a selectively slidable shroud received over said knife body, said shroud defining a generally cylindrical bore therethrough for receiving said elongate body, said knife body defining a longitudinal groove therein, a projection carried by said shroud and slidably receivable within said longitudinal groove, said projection being located within said bore and projecting radially thereof, said longitudinal groove extending along said knife body parallel to the axis of said knife body, said body further including a cap at the end of said knife body opposite said one end, said cap being sufficiently large to prevent movement of said shroud beyond said cap, said body further defining a first locking groove extending circumferentially of said knife body and communicating with said longitudinal groove, said first locking groove being located so that, when said shroud is in a first position surrounding said cutting blade, said projection is receivable within said first locking groove by rotation of said shroud with respect to said knife body, a second locking groove extending circumferentially of said knife body and communicating with said longitudinal groove, said second locking groove being located so that, when said shroud is in a second position exposing said cutting blade and adjacent to said cap, said projection is receivable within said second locking groove by rotation of said shroud with respect to said knife body, and a third locking groove extending circumferentially of said knife body and communicating with said longitudinal groove, said third locking groove being located so that, when said shroud is in a third position exposing said cutting blade with said shroud in an intermediate position on said knife body, said projection is receivable within said third locking groove by rotation of said shroud with respect to said knife body, said knife body being tapered towards said one end, said knife body including a ring for centering said shroud on said knife body when said shroud is in said first position.

4,576,165
SURGICAL LIGATION AND CUTTING DEVICE WITH SAFETY MEANS

David T. Green, and Richard A. McGarry, both of Norwalk, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 23, 1984, Ser. No. 573,066
Int. Cl.[4] A61B *17/11*
U.S. Cl. 128—305 34 Claims



1. An apparatus for ligating and cutting body tissue comprising:

means for ligating body tissue at two spaced apart locations with two plastic clips separated from a pair of clip trains;

means for cutting said body tissue between said spaced apart locations after said body tissue has been ligated by said ligating means, wherein said cutting means operates along a predetermined path in the apparatus;

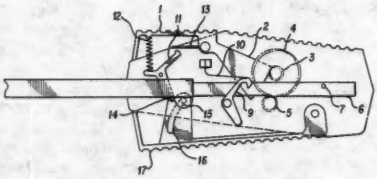
pusher means for advancing said clip trains and for separating said clips from said clip trains; and

safety means responsive to said pusher means for preventing said cutting means from cutting said body tissue, wherein said safety means has a means for blocking said path when said safety means responds to said pusher means.

4,576,166
SURGICAL LIGATING INSTRUMENT

John R. Montgomery, Fairfield; Milton W. Brumaghim, Newton, and Jose C. Deniega, Brookfield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1981, Ser. No. 278,258
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 5 Claims



1. A surgical ligating instrument comprising

A. a housing having

I. a trigger, which can be activated by at least one thumb to cause a first force;

II. a sector gear on the distal end of said trigger, at least one reduction gear which meshes with said sector gear, and a rack which meshes with said reduction gear, to effect said first force;

III. a handle, which can be activated by at least one finger to cause a second force;

IV. means for translating said second force from said handle to a movable pin, to effect said second force; and

V. an interlock between said trigger and said handle such that said trigger is completely compressed before said handle is compressible; and

B. a probe having

I. means for advancing a plurality of ligating clips comprising

a. a pair of aligned members, each member containing an internal slot, the proximal end of said members contained in said housing and the distal end having canted jaws, said jaws during compression of said handle having no rectilinear motion relative to said housing;

b. a single clip actuator rotatably mounted adjacent the proximal end of said jaws, said actuator having a first and a second pawl in alternate relationship such that said actuator can repeatedly release the frontmost clip from said plurality of clips;

c. a spring, the proximal end contained to said housing;

d. a pusher at the distal end of said spring; and

e. a plurality of clips, the rearmost clip adjacent said pusher and the frontmost clip contained by said actuator, said spring, pusher and clips contained by the internal slots of said aligned members;

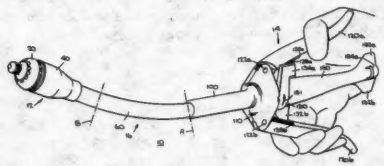
II. means for loading a ligating clip from the proximal end of said jaws comprising an injector, said injector having holding means such that said injector can be held adjacent to a single clip in said jaws, the proximal end of said injector adjacent said rack in said housing and the distal end adjacent a single clip, said injector adjoining said aligned members; and

III. means for crimping a single clip in said jaws comprising a movable crimp bar, the proximal end adjacent said movable pin in said housing and the distal end adjacent said jaws.

4,576,167
SURGICAL STAPLER APPARATUS WITH CURVED SHAFT

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 3, 1981, Ser. No. 299,106
Int. Cl.[4] A61B *17/11*
U.S. Cl. 128—334 R 3 Claims



1. Apparatus for applying surgical staples to body tissue comprising:

an anvil assembly;

a staple holding assembly containing a plurality of surgical staples and including (a) a first body, (b) anvil support means for supporting the anvil assembly for motion relative to the first body to allow the tissue to be stapled to be clamped between the anvil assembly and the first body, and (c) pusher means movably mounted relative to the first body for driving the staples from the staple holding assembly through the clamped tissue and against the anvil assembly;

an actuator assembly remote from the staple holding assembly and including (a) a second body, (b) first actuator means movably mounted on the second body for controlling the anvil support means, and (c) second actuator meaans movably mounted on the second body for controlling the pusher means; and

a longitudinal shaft assembly including (a) a rigid longitudinal shaft member connected at one end to the first body and at the other end to the second body, the shaft member being a hollow tube having a longitudinally curved section intermediate its ends, at least a portion of the curved section having uniform radius, the shaft member also including a longitudinally straight section substantially tangent to one end of the portion of uniform radius, (b) a longitudinal tension member disposed in the shaft member for longitudinal motion relative to the shaft member for transmitting longitudinal tension force and longitudinal motion from the first actuator means to the anvil support means to pull the anvil assembly

toward the first body to clamp the tissue and to resist the force of the staples being driven through the tissue and against the anvil assembly, the tension member being longitudinally flexible and longitudinally inextensible and incompressible, (c) a longitudinal compression member disposed in the shaft member for longitudinal motion relative to the shaft member for transmitting longitudinal compression force and longitudinal motion from the second actuator means to the pusher means to cause the pusher means to drive the staples, the compression member being a longitudinally inextensible and incompressible hollow tube concentric with the shaft member tube, the compression member tube being articulated adjacent the point of tangency of the straight section of the shaft assembly to permit some relative longitudinal motion between the tubes without binding of the tubes relative to one another, the tension member being disposed in the interior of the compression member tube, and (d) means associated with the curved section of the shaft assembly for maintaining each of the tension member and the compression member coaxial with respective predetermined longitudinal axes in the shaft member while allowing the tension member and the compression member to move longitudinally relative to one another and relative to the shaft member, the means for maintaining comprising spacer means between the concave side of the tension member and the opposite inner surface of the compression member tube in the curved section of the shaft assembly.

4,576,168

NASAL DILATOR

Alfredo A. Jalowayski, 6864 Lipmann St., San Diego, Calif. 92122

Filed Jan. 5, 1983, Ser. No. 455,651
Int. Cl.⁴ A61M *29/00*
U.S. Cl. 128—342 **11 Claims**

1. A disposable nasal dilator which comprises:

a pair of elongated, spaced-apart, generally bilaterally symmetrical lever arms having proximal and distal ends;

a pair of opposed, generally parallel, elongated dilating members projecting from said distal ends of the respective said lever arms; and

spring means extending laterally between said lever arms, said spring means and said pair of dilating members being of unitary molded plastic construction with said spring means being substantially rigidly secured to both of said lever arms at substantially the same locations along their lengths intermediate their ends;

said spring means constituting the sole supporting means for said lever arms;

said spring means supporting said lever arms in a normal position of repose in which said dilating members are in a substantially closed-together position;

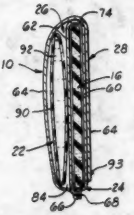
movement of said proximal ends of said lever arms toward each other against the force of said spring means causing said dilating members to spread apart to an open position for dilating a nasal passage.

4,576,169

COMFORT COLLAR

Annie J. Williams, 3015 N. Stockton, Ada, Okla. 74820

Filed Jul. 26, 1984, Ser. No. 634,746
Int. Cl.⁴ A61F *7/10*
U.S. Cl. 128—402 **8 Claims**



1. An improved comfort collar adapted to be worn about the neck of a person subjected to high ambient heat conditions comprising:

(a) a unitary body member formed of a water-absorbent textile material and having a first and a second elongated cavity formed therein, the second cavity being divided into a plurality of segments, the unitary body member adapted to substantially encompass and form a continuous collar about the neck of the wearer, the unitary body member further characterized as having a first side portion, a medial portion and a second side portion, the first side portion and the medial portion being connected along a lower, adjacently disposed longitudinally extending edge so as to define the first elongated cavity therebetween, the second side portion of the body member extending from the medial portion and cooperating with the medial portion to define the second elongated cavity therebetween, the second side portion of the body member further provided with a closure flap portion positionable in one of a first position and a second position, in the first position the closure flap portion extending away from the medial portion of the unitary body member such that substantially unrestricted access is permitted to the second elongated cavity, in the second position the closure flap portion extending over an uppermost portion of the body member defining the first elongated cavity such that the closure flap portion is disposed substantially adjacent the first side portion of the body member and closes off the second elongated cavity;

(b) an elongated insulation member disposed within the first elongated cavity so as to be substantially encapsulated therein, the elongated insulation member being fabricated of a sufficiently pliable material such that the insulation member is adapted to substantially encompass the neck of the wearer; and,

(c) cooling means disposable within the segments of the second elongated cavity for providing a comfort zone to receive heat from the wearer's neck.

4,576,170

HEART MONITOR AND DEFIBRILLATOR DEVICE

Robert F. Bradley, and Lindell P. Bradley, both of New Buffalo, Mich., assignors to Micro-Circuits Company, New Buffalo, Mich.

Filed Jul. 9, 1980, Ser. No. 167,382
Int. Cl.⁴ A61N *1/32*
U.S. Cl. 128—419 D **15 Claims**

1. A heart monitor and defibrillator device for continuously monitoring heart functions and automatically administering defibrillating shock charges, comprising sensing electrodes for

continuously detecting heart impulses, amplification means for intensifying and sorting the heart impulses detected by said sensing electrodes, microprocessor means receiving the impulses from said amplification means for analyzing the impulses and determining when a defibrillation shock charge is required, defibrillation circuitry controlled by said microprocessor means having automatic recharge capabilities, a delay means for discharging a defbrillation charge a short time after the necessity of defibrillation is detected by said microprocessor means, warning means for notifying the patient before a defibrillation shock charge is administered, and defibrillator electrodes to be attached to the patient's chest for administering the defibrillation shock charge to the patient's heart.

4,576,171

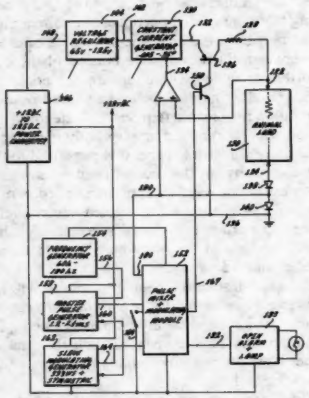
ANIMAL IMMOBILIZING APPARATUS AND METHOD

Richard Key, 1807 Iowa St., Costa Mesa, Calif. 92626

Filed Feb. 8, 1984, Ser. No. 578,269

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—421 **10 Claims**



1. An apparatus for applying an electronarcotic signal to an animal comprising:

electrode means for making and maintaining electrical contact with said animal; and

a source for generating said electronarcotic signal, said source coupled to said electrode means, said source comprising a feedback loop coupled to said electrode means for adjusting said electronarcotic signal in accordance with the intrinsic electrical resistance path through said animal is included as a part of said feedback loop of said source,

whereby individual variations among animals is automatically compensated by adjustment of said source for generating said electronarcotic signal by inclusion of the intrinsic resistance through said animal within said feedback loop of said source.

4,576,172

SWITCHED ELECTRICAL APPARATUS FOR MEDICAL USE

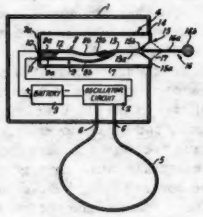
Richard H. C. Bentall, The Basement, 7 Penzance Pl., London W11 4PE, Great Britain

Filed May 18, 1983, Ser. No. 495,619

Claims priority, application United Kingdom, May 26, 1982, 8215296; May 26, 1982, 8215301

Int. Cl.[4] A61N *1/32*

U.S. Cl. 128—422 **12 Claims**



1. Switched electrical apparatus for medical use, comprising:

a closed sealed container;

an electrical power source disposed in the container;

an electrical circuit disposed in the container for being powered by the source;

an electrical switch including first and second electrical contacts;

means urging said contacts towards one another to establish an electrically conductive condition therebetween;

an elongate flexible electrically insulating member between the contacts and holding them apart to establish a non-conductive condition therebetween, said member having an end exteriorly of the contacts for being pulled longitudinally to remove the member from between the contacts to allow them to engage one another and establish said conductive condition; and,

a flexible wall region in said sealed container to which said end of the member is coupled so that by pulling said wall region outwardly of the container said member is removed from between said contacts, said member possessing insufficient longitudinal rigidity in longitudinal compression that upon urging said wall region inwardly of the container toward said contacts, after removal of said member from between said contacts, the member cannot be re-inserted between the contacts, whereby said conductive condition can be established without breaking the seal of the container, and cannot thereafter be interrupted.

4,576,173

ELECTRO-OPTICAL DEVICE AND METHOD FOR MONITORING INSTANTEOUS SINGLET OXYGEN CONCENTRATION PRODUCED DURING PHOTORADIATION USING A CW EXCITATION SOURCE

John G. Parker, Olney, and William D. Stanbro, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 393,188, Jun. 28, 1982. This application Jul. 11, 1984, Ser. No. 629,854

Int. Cl.[4] A61B *6/00*; A61N *5/00*

U.S. Cl. 128—633 **38 Claims**

1. An apparatus for detecting singlet oxygen emission produced during photoradiation:

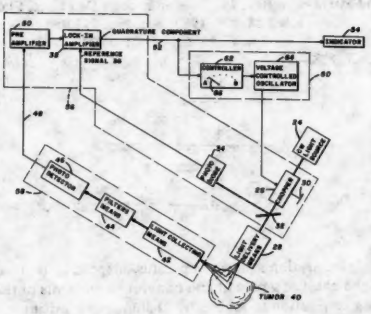
an optical excitation means for illuminating a particular portion of a medium containing a photodynamic sensitizer

with chopped optical radiation of a wavelength capable of at least causing generation of a singlet oxygen emission;

an optical detection means for collecting light emitted from said medium and for detecting a composite optical signal in a 1.27 micron singlet oxygen emission band, the band having a bandwidth including a sensitizer fluorescent emission signal component and a singlet oxygen emission signal component that is out of phase with the fluorescent signal component;

a signal processing means, operably associated with said optical detection means, for processing said composite optical signal and for separating said singlet oxygen signal component from said sensitizer fluorescent signal component by utilizing a difference in phase between the two signal components; and,

a responsive means, operably associated with said signal processing means, for providing an indication of the magnitude of said singlet oxygen signal component.



23. A therapeutic light dosimetry procedure for use in the photoradiation therapeutic treatment of a living body, wherein said living body is injected with a photosensitive dye capable of generating singlet oxygen in said living body, said dosimetry procedure comprising the steps of:

irradiating the injected photosensitizing dye with a certain light dosage, causing said photosensitizing dye to energize available local oxygen existing in said living body to generate singlet oxygen;

detecting the emission produced from singlet oxygen radiative decay in the 1.27 micron singlet oxygen emission band from a plurality of different emissions in the same band that are caused by the light in the step of irradiating;

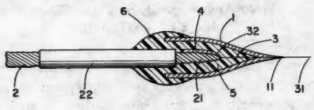
determining the magnitude of the detected emissions to indicate the extent available local oxygen depletion has reduced singlet oxygen production.

4,576,174

MICRO ELECTRODE

Hiroshi Miyazaki, and Masato Ikeda, both of Nara, Japan, assignors to Shionogi & Company, Ltd., Osaka, Japan

Filed Jun. 29, 1983, Ser. No. 509,034
Claims priority, application Japan, Jul. 8, 1982, 57-119035
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **1 Claim**



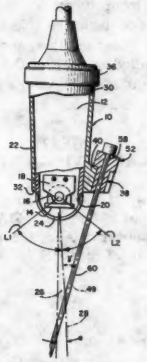
1. A micro electrode consisting of a tapered glass capillary tube forming a cavity, said tube having a thick end with an outside diameter of 2 mm or smaller and a needle end, an outer lead wire within said tube and extending from said thick end thereof, a carbon fiber conductive filament having an outside diameter of 50 μm or smaller and having a first end and a second end, a conductive resin containing carbon powder within said cavity of said capillary tube connecting said outer lead wire to said first end of said conductive filament, a second end of said conductive filament projecting from said needle end of said capillary tube, an insulative resin filler packed in said cavity of said capillary tube around said outer lead wire where said wire is connected to said conductive filament, and a protective resin at said thick end of said capillary tube formed about said lead wire and said tube.

4,576,175

BIOPSY ATTACHMENT FOR ULTRASONIC PROBE

Moshe Epstein, 1530 Beacon St., Brookline, Mass. 02146

Filed Sep. 6, 1983, Ser. No. 529,624
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **11 Claims**



1. A biopsy attachment for a probe having a transducer for producing a beam of ultrasonic energy, said attachment comprising:

(a) a housing associated with the probe and having a recess;

(b) a bushing having an axial aperture of given length for receiving a biopsy needle and surrounding, engaging and supporting said needle throughout said length; and

(c) said bushing and said housing having cooperable means responsive to positioning the bushing in a first angular position relative to the housing for effecting displacement of the bushing into the recess to an inserted position, and responsive to the rotation of the bushing in one direction, when in its inserted position, from its first angular position, for frictionally holding the bushing in a second angular position.

4,576,176

TRANSDUCER FOR MEASUREMENT OF CORNEAL THICKNESS

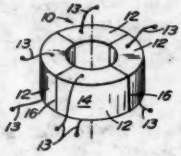
George H. Myers, Maplewood, N.J., assignor to Medsys, Inc., Rutherford, N.J.

Division of Ser. No. 521,132, Aug. 8, 1983, Pat. No. 4,508,121.
This application Dec. 21, 1984, Ser. No. 672,497
Int. Cl.[4] G01N *29/00*
U.S. Cl. 128—660 **7 Claims**

1. A transducer for use in corneal measurements, said transducer comprising:

a plurality of peizo-electric arcuate segments for producing ultra-sonic signals, said segments arranged in a circle to form a toroidal member having upper and lower surfaces lying in a plane perpendicular to the axis of the toroid,

each one of said segments having a vibratory axis, the vibratory axis of each segment being oriented so that the ultrasonic signals produced by said plurality of segments are propagated along a path substantially parallel to the axis of said toroid, whereby said ultrasonic signals are directed toward an eye located adjacent one of said surfaces;



insulation means for electrically isolating each of said plurality of segments from the other;

acoustic means for acoustically isolating each of said plurality of segments from the other; and

lead means connected to each of the plurality of segments for transmission of electrical signals.

4,576,177

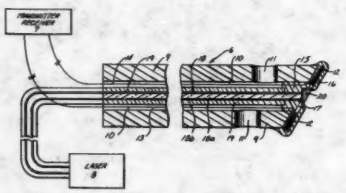
CATHETER FOR REMOVING ARTERIOSCLEROTIC PLAQUE

Wilton W. Webster, Jr., 1388 Crest Dr., Altadena, Calif. 91001

Continuation-in-part of Ser. No. 467,754, Feb. 18, 1983, abandoned. This application Aug. 1, 1983, Ser. No. 518,817

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660 **27 Claims**



1. A catheter adapted to be inserted into a blood vessel for identifying and removing arteriosclerotic plaque deposits in said blood vessel, said catheter having proximal and distal ends and a lumen comprising:

an elongated optical fiber having proximal and distal ends disposed within the lumen of the catheter tube and extending the length of the catheter tube for transmitting laser irradiation;

an ultrasonic transducer mounted at the distal end of the catheter adjacent the distal end of the optical fiber for transmitting the receiving ultrasonic signals; and

a pair of wires electrically connected to the ultrasonic transducer extending the length of the catheter.

4,576,178

AUDIO SIGNAL GENERATOR

David Johnson, 436 E. 69th St., New York, N.Y. 10021

Filed Mar. 28, 1983, Ser. No. 479,203

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—670 **10 Claims**

1. A system for providing a distinguishable audible output varying in accordance with a condition to be monitored comprising first means for generating a signal that varies in accordance with variations of a monitored condition, and audio signal generator means receiving said signal from said first

means and generating an audible output that varies in n discrete steps corresponding to a range of variation of said signal.

4,576,179

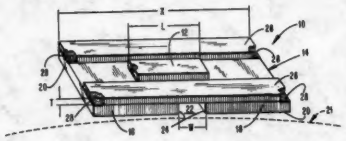
RESPIRATION AND HEART RATE MONITORING APPARATUS

Eugene A. Manus, 1005 Kentwood Dr., Blacksburg, Va. 24060, and Paris H. Wiley, 1907 Ceder Brooke Dr., Lutz, Fla. 33549

Filed May 6, 1983, Ser. No. 492,056

Int. Cl.⁴ A61B *5/08, 5/04*

U.S. Cl. 128—671 **29 Claims**



1. A respiration sensing apparatus adapted to be held adjacent the chest of a patient and convert movements of the chest during respiration to an electrical signal, comprising:

a first, rigid pier having a principal surface adapted to be disposed generally parallel to the outer surface of the chest of the patient;

a second, rigid pier having a principal surface adapted to be disposed generally parallel to the outer surface of the chest of the patient, said second pier being separated from the first pier to define a gap therebetween;

a first elongated flexible beam bridging the gap between the first and second piers;

a second, elongated flexible beam bridging the gap between the first and second piers, and lying in spaced, parallel relation to the first beam;

a piezoelectric crystal, located between the first and second beams and bridging the gap between the first and second beams; and

a flexible belt adapted to encircle the chest of the patient, said beams, piers and crystal being attached to said belt, and said belt together with said beams and piers, apply a bending stress to said piezoelectric crystal in response to expansion of the chest during respiration.

4,576,180

METHOD AND APPARATUS FOR MONITORING LEG BLOOD PRESSURE OF AN AMBULATORY PATIENT

Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221

Filed Aug. 8, 1983, Ser. No. 521,148

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—673 **22 Claims**

1. A blood pressure monitor for monitoring the venous blood pressure in the leg of an ambulatory patient for a period of time which includes the normal daily activities of said patient to aid in the diagnosis of vascular disease of the leg comprising a catheter for insertion into a venous blood vessel in the leg, means coupled to said catheter for measuring blood pressure in said venous blood vessel, first means for recording said blood pressure, and second means associated with said first

means for recording the attitude of at least one of the patient's leg, thigh and side with respect to said blood pressure in said

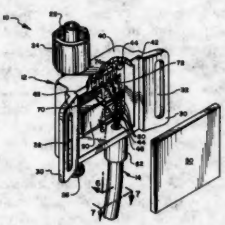
venous blood vessel in the leg to thereby correlate said attitude with said blood pressure.

4,576,181

DISPOSABLE PRESSURE TRANSDUCER APPARATUS FOR MEDICAL USE

William D. Wallace, Salt Lake City, and Christopher A. Cutler, Bountiful, both of Utah, assignors to Utah Medical Products, Salt Lake City, Utah

Filed May 9, 1984, Ser. No. 608,761
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—675 25 Claims



1. In a direct blood pressure measurement system having a monitor device coupled to an indwelling, fluid-filling catheter adapted to be inserted into a patient, a disposable pressure transducer apparatus with a dielectric substrate having first and second sides and a pressure transducer having a piezoresistive pressure diaphragm secured to said first side of said substrate, said apparatus comprising:

means circuit for temperature compensation provided on said first side of said substrate, said circuit means being electrically connected to said pressure diaphragm;

means for electrically connecting said circuit means for temperature compensation and said pressure transducer to said monitor device, said connecting means being attached to said circuit means and said pressure transducer on said first side of the substrate;

means for housing said substrate, said housing means comprising a first passageway communicating with said fluid-filled catheter, a second passageway providing fluid communication between said pressure diaphragm and said first passageway, and means for mounting said substrate in said housing means such that said second side of the substrate faces toward said second passageway and said first side of the substrate faces away from said second passageway; and

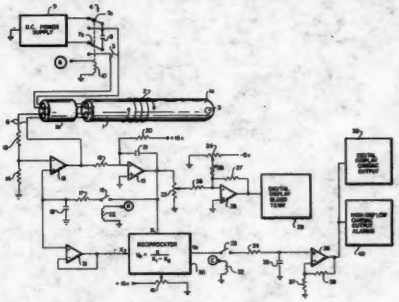
means for hydraulically coupling said pressure diaphragm through said second passageway to said first passageway and the fluid-filled catheter communicating with said first passageway.

4,576,182

METHOD AND APPARATUS FOR MEASURING LIQUID FLOW

Richard A. Normann, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Apr. 23, 1981, Ser. No. 256,689
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—692 11 Claims



1. Apparatus for measuring liquid flow through a channel comprising

an elongate body member dimensioned for insertion into the channel,

means disposed on the said body member for producing heat in response to receipt of electrical energy,

means for successively delivering to said heat producing means a predetermined amount of electrical energy, said delivering means including

means for storing a predetermined electrical charge,

power supply means for supplying electrical current, and

switch means for alternately connecting the storing means to the power supply means and to the heat producing means, and

temperature measuring means disposed on the said body member and spaced downstream of said heat producing means for measuring the change in temperature of the liquid flowing thereby through the channel, said change occurring as a result of heat produced by said heat producing means.

4,576,183

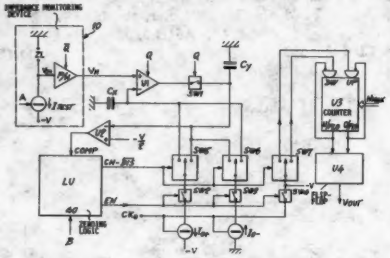
ELECTRONIC CIRCUIT FOR MONITORING RESPIRATORY PARAMETER FOR CONTROLLING OPERATION OF IMPLANTABLE MEDICAL DEVICE

Gianni Plicchi, 77/7, Via Maccarella, and Giancarlo Canducci, 27, Via Cesare Pavese, both of Bologna, Italy

Filed Sep. 17, 1984, Ser. No. 651,354
Claims priority, application Italy, Sep. 21, 1983, 12624 A/83; Jun. 28, 1984, 12550 A/84
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—723 9 Claims

1. An electronic circuit for detecting a respiratory parameter in a device which is implantable in a patient's body and which is operable in response to such respiratory parameter, said circuit comprising: a measurement and impedance/voltage conversion unit for detecting the impedance of a part of the patient's body where the impedance varies in dependence on respiration, said unit including sampling means which effects sampling of the impedance during discrete sampling times occurring at selected time intervals, and means for producing an output signal representative of the sampled impedance values; signal processing circuit means connected to said unit for producing, in response to the output signal from said unit, a clean, regular signal representative of deviations of the impedance from a selected base impedance value, said signal pro-

cessing circuit means comprising signal processing means operable for causing the clean, regular signal to vary between two selected amplitude values each time that, and only when,



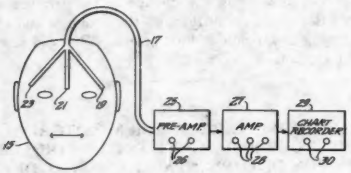
the difference between successive peak values of the output signal exceeds a selected value; and means for deriving from the clean, regular signal a control signal for controlling the operation of the implantable device.

4,576,184

DRUG ABUSE DETECTION

S. Thomas Westerman, Shrewsbury, N.J., assignor to Pharmometrics Corporation, New Brunswick, N.J.

Continuation of Ser. No. 297,997, Aug. 31, 1981, abandoned.
This application Apr. 23, 1984, Ser. No. 603,243
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—733 **11 Claims**



1. A non-invasive method of detecting drug ingestion by a subject comprising the steps of:

(a) non-invasively establishing a plurality of reference waveforms by separately recording time-varying fluctuations in cornea-retinal potential (CRP) and/or brainwaves for each of a series of selected drugs administered to an individual who has been pre-examined for freedom from drugs, said recordings for each drug in the series being made in a standardized set of at-rest conditions;

(b) non-invasively measuring the subject's waveform, by recording time-varying fluctuations in cornea-retinal potential (CPR) and/or brainwaves, for each of the at-rest conditions of said standardized set; and

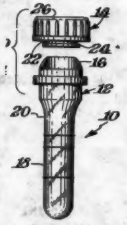
(c) comparing the subject's measured waveforms with said plurality of reference waveforms to ascertain the existence vel non of any correlation therebetween, thereby determining the presence or absence in said subject of any of said selected drugs.

4,576,185

COLLECTION DEVICE FOR CAPILLARY BLOOD

Todd A. Proud, Claymont; Tom F. Lin, Bear, both of Del.; Wayne J. Mitchell, Elkton, Md., and James D. Kasper, Montpelier, Ohio, assignors to Terumo Medical Corporation, Elkton, Md.

Filed Dec. 5, 1983, Ser. No. 557,962
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—760 **8 Claims**



1. A collection device for capillary blood comprising a container portion in the form of a tube having an open uper end and a closed lower end, a collector portion secured to said upper end of said tube in flow communication therewith, said collector portion having upper and lower ends, inner and outer surfaces, and further including means for conveying blood from a user and into said container portion, closure means for selectively sealing the upper end of said collector portion during non-collecting use of said device, said closure means having a recess of a shape and dimension whereby said lower end of said tube is selectively nested into said closure recess during collecting use of said device, said collector portion being integral with said container portion, said upper end of said collector portion being in the form of an arcuate lip extending coaxially therefrom to comprise said blood conveying means, said closure means including an overcap, an axial plug extending downwardly away from said overcap with an annular channel therebetween formed by a wall bridging said overcap and said axial plug, a resilient annular flange extending radially outwardly from said axial plug, said resilient annular flange being dimensioned to snugly slide in said collector portion, said resilient annular flange comprising wipe means for wiping the inner surface of said collector portion when said closure means is applied thereto, said plug sealing said collector portion, said lip fitting in said annular channel whereby said overcap comprises a shield for said collector portion during non-collecting use of said device, stop means on the outer surface of said collector portion located to limit the downward movement of said overcap to maintain said lip spaced from said wall bridging said overcap and said plug, and said plug being hollow with an open upper end to comprise said recess.

4,576,186

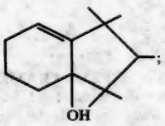
USE OF PENTAMETHYLINDANOL DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO COMPOSITIONS OR SMOKING TOBACCO ARTICLES

John B. Hall, Rumson, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 589,662, Mar. 14, 1984, Pat. No. 4,520,032.
This application Nov. 14, 1984, Ser. No. 671,331
Int. Cl.[4] A24B *15/30*
U.S. Cl. 131—276 **7 Claims**

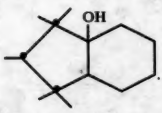
1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition comprising the step of adding to said smoking tobacco composition an aroma augmenting or enhancing quantity of a composition of matter selected from the group consisting of:

(i) the compound having the structure:



and

(ii) the compound having the structure:



4,576,187

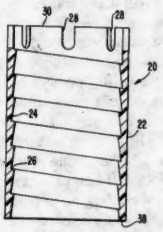
VARIABLE AIR DILUTION CIGARETTE FILTER

Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 22, 1984, Ser. No. 663,681

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 **8 Claims**



1. A variable air dilution cigarette filter assembly for attachment to a tobacco rod to form a variable air dilution cigarette, said filter assembly comprising:

a thin, generally rigid cylindrical sleeve having at least one air slot passing through a circumferential wall of said sleeve;

a filter rod positioned within said sleeve;

retention means in said sleeve, including a plurality of radially inwardly-extending steps on an inner wall of said sleeve, for retaining said filter rod within said sleeve while allowing rotation between said sleeve and said filter rod; and

means for varying dilution air flow through said air slot to said filter rod in response to relative rotation of said sleeve and said filter rod.

4,576,188

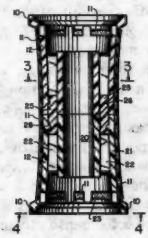
HEATABLE ROLLER FOR CURLING HAIR

George Barradas, 15 Riverview Ct., Glenville, Conn. 06830

Filed Feb. 23, 1984, Ser. No. 582,902

Int. Cl.[4] A45D *2/02*

U.S. Cl. 132—39 **14 Claims**



1. A roller for curling hair comprising a pair of coaxial tubular members having the same outer diameters and being axially affixed together at one respective end whereby said ends abut each other and each having a flange of enlarged diameter at the other respective end thereof, the flanges being partially separate from the respective tubular members by vents extending through the tubular members, and a removable foam sleeve covering the outer radial surface of said tubular members between the flanges thereof and non-adhesively held thereon.

4,576,189

PARTIAL WIG ASSEMBLY WITH EXTENSION PORTION

Ruth Regina, 1050 Kane Concourse, Bay Harbor Island, Fla. 33154

Continuation of Ser. No. 572,304, Jan. 20, 1984, abandoned. This application Feb. 28, 1985, Ser. No. 706,697

Int. Cl.[4] A41G *3/00*

U.S. Cl. 132—53 **9 Claims**

1. A partial wig assembly comprising:

(a) a foundation of flexible sheet material being of predetermined density and including a substantially elliptical configuration generally conforming to the shape of the top of the frontal portion of a human head,

(b) said foundation including a front boundary edge and a rear boundary edge both joined at the correspondingly positioned opposite ends thereof and at opposite ends of a major axis of said elliptical configuration,

(c) said rear boundary edge extending over the top of the head, between the temple portions thereof, when said front boundary edge is in general registry and alignment with the front hairline,

(d) side bands extending from opposite ends of said major axis and said joined boundary edges in spaced relation to one another and rearwardly of said foundation,

(e) a back band disposed in interconnected relation between distal ends of said side bands to at least partially define therewith a central opening, said back band extending downwardly and rearwardly to encompass the lower rear portion of the head,

(f) said central opening having a substantially closed periphery and being of sufficient dimension to allow passage of natural hair of the wearer therethrough,

(g) an extension portion secured to said foundation along said rear boundary edge and disposed to extend into said central aperture therefrom rearwardly of said foundation,

(h) said extension portion comprising a frontal portion fixedly secured continuously along a major portion of the length of said rear boundary edge, a rear peripheral edge having a curvilinear configuration, said rear peripheral edge disposed along its length in inwardly spaced relation from said back band and said side bands,

(i) said extension portion formed of substantially flexible, porous, air permeable material having a density substantially less than that of said foundation and structured to allow ventilation of the wearer's scalp therethrough,

(j) hair secured in selected density to and distributed over an outer surface area of both said foundation and said extension portion,

(k) said rear peripheral edge cooperatively disposed with said side bands and said back band to collectively define said closed periphery of said central opening;

(l) said frontal portion of said extension portion mounted contiguous to said rear boundary edge of said foundation and along therewith configured to correspond to the shape of a top portion of the human head,

(m) an adjustable fastening means secured to said back band for accomplishing an effective shortening of said back band between said side bands and comprising a strip element movably mounted in hidden disposition on the interior of said back band.

4,576,190

TOOTHSTICKS "TOOSTIX"

Kamal A. Youssef, P.O. Box 6548, W. Palm Beach, Fla. 33405

Filed Dec. 21, 1982, Ser. No. 451,978

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—89 **6 Claims**

1. A complete, disposable, dental hygienic instrument, comprising:

an elongate handle means;

a resilient, open-cell foam scrubbing and brushing means fastened to a first end of said elongate handle means;

scraping and stain removing means provided by a generally wedge shaped second end of said elongate handle means;

dental floss having one end thereof permanently attached to said elongate handle means at a point intermediate the ends of said elongate handle means, the balance of said dental floss is wrapped around said elongate handle means for storage, the other end of said dental floss being unrestrained and free for grasping;

toothpick means removably and conformably wound about said elongate handle means, said toothpick means comprising an elongate malleable wire core completely covered by flexible plastic coating means further projecting laterally into a pair of diametrically opposed thin plastic ribs, said ribs being substantially in the same plane as said wire core and thinner at their distal edge than the coated wire and extending more than a millimeter laterally.

4,576,191

UMBRELLA FRAME

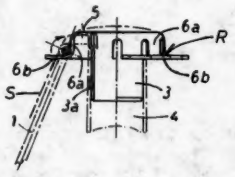
Tilmann Schultes, and Joachim Seidel, both of Solingen, Fed. Rep. of Germany, assignors to Kortenback & Rauh KG, Soligen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,893

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346672

Int. Cl.[4] A45B *25/00, 25/18, 25/08*

U.S. Cl. 135—30 **6 Claims**



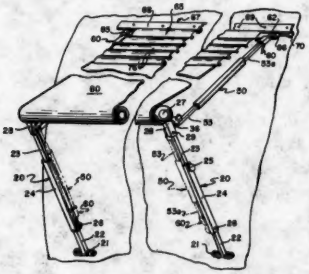
1. In an umbrella frame comprising a stick, a crown and a slider, a first pivotal connection of a plurality spokes to said crown, a second pivotal connection of a plurality of struts to said slider, at least one of said first and second pivotal connections comprising a substantially cylindrical sheet metal sleeve carried by said stick and provided at one end with a star-like array of radially outwardly projecting, inwardly curled lobes, said lobes having edge means defining slits therebetween, members constituted by one of said plurality of canopy spokes and struts hinged at inner ends thereof in respective ones of said slits by means of at least one pivot pin located within said inwardly curled lobes; the improvement comprising a single, one-piece element including an annular flange extending radially outwards from said one sleeve end; each of said lobes comprising an inner section connected to said flange and being of a greater length than the cross section of said one pivot pin and extending substantially axially of said sleeve at a location spaced from said sleeve, and an outer section positioned outwardly of said inner section prior to assembly and connected thereto via a radius portion corresponding substantially to a cross section profile of the pivot pin, free ends of said outer lobe sections being permanently curled inwardly to locate said at least one pivot pin resting in said radius portions, said curled lobe outer sections having a free outer edge disposed substantially adjacent to said inner section and spaced from and confronting the outer surface of said inner section.

4,576,192

AWNING ASSEMBLY

Henry J. Duda, Elk Grove Village, Ill., assignor to Randall Equipment Company, Chicago, Ill.

Filed Jan. 24, 1983, Ser. No. 460,178
Int. Cl.[4] E04F *10/00*
U.S. Cl. 135—89 10 Claims



1. An awning for a vehicle, said awning comprising: a pair of spaced apart support arms each having one end thereof pivotally secured to the vehicle, two caps respectively carried by said support arms at the other ends thereof, a roller rotatably supported between said caps, at least one end of said roller having a plurality of alternating detents and ribs formed therein facing the adjacent one of said caps, said cap facing said one end of said roller having a threaded aperture therethrough, a screw threadedly engaged in said aperture and extending therethrough for engagement with said ribs to prevent rotation of said roller with respect to said cap regardless of the positions of said support arms, a flexible covering having one end thereof secured to said roller to be wound therearound, a flexible strip secured to the opposite end of said flexible covering to form a casing therefor when said flexible covering is completely rolled around said roller, latch receivers carried by said flexible strip respectively adjacent to the opposite ends thereof, means on said roller to cause said roller to roll said flexible covering therearound, a pair of brace arms each having one end thereof pivotally mounted on a corresponding one of said support arms, and latches respectively carried by said brace arms at the other ends thereof for latching engagement with said receivers when said flexible covering is unrolled for maintaining it in an unrolled condition.

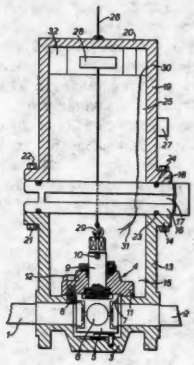
4,576,193

DEVICE FOR WORKING ON A SUBMERGED VALVE

Jean-Luc A. Hervé, Noisy-Le-Roi, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Mar. 13, 1985, Ser. No. 711,128
Claims priority, application France, Mar. 22, 1984, 84 04428
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—15 2 Claims

1. An apparatus for servicing a submerged valve which comprises a valve body (3), a closure member (5) movable within said body, and actuating means (9) for said closure member, said actuating means projecting upwardly from said valve body, said apparatus comprising: a lower box means (13) adapted for vertical installation and having an open upper end and a lower end sealingly fixed to said valve body such that said lower box means surrounds said actuating means; an upper box means (19) adapted to be installed vertically and having a closed upper end (20) and an open lower end, said upper box means containing lifting means (28) for removing and replacing said actuating means, a screwing and unscrewing robot (32) for assembling and disassembling said submerged valve and a camera (30, 31), pumping means (27) provided on said upper box means for moving fluids into and out of said box means; an intermediate valve (17) slidably disposed in a generally flat body (16); and means (21–24) for sealingly connecting said flat body of said intermediate valve between said open upper end



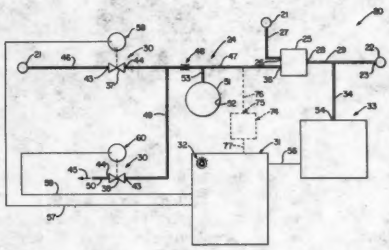
of said lower box means and said open lower end of said upper box means.

4,576,194

PNEUMATIC CONTROL SYSTEM, CONTROL MEANS THEREFOR AND METHOD OF MAKING THE SAME

William L. Lucas, Henrico County; Clarence M. Asbill, III, Richmond; Gerald L. Frank, and David M. Miller, both of Henrico County, all of Va., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 19, 1984, Ser. No. 602,018
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—84 6 Claims



1. In a pneumatic control system comprising a pneumatic source, a pneumatically operated device that produces an output, and a control means for interconnecting said source to said device, said control means having an input means interconnected to said source and an output means interconnected to said device, said control means having set point means for selecting a desired output of said device, said control means having valve means for controlling the interconnection between said input means and said output means so as to regulate the pressure value in said output means, said control means having regulating means for operating said valve means to tend to produce an output of said device that corresponds to said selected output of said set point means, said regulating means having means that senses said pressure value in said output means and operates said valve means so as to produce a pressure value in said output means that is substantially equal to a pressure value that will cause said device to produce said selected output, said control means comprising a relay means having said input means and said output means, said relay

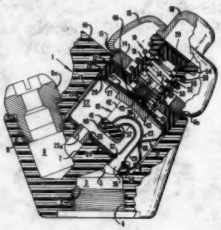
means having a pilot input and a valve unit for interconnecting said input means to said output means in relation to the pressure value in said pilot input, said valve means being interconnected to said source and to said pilot input whereby said regulating means operates said valve means to create said pressure value in said pilot input in relation to the sensed pressure value in said output means, said control means comprising an accumulator means interconnected to said pilot input intermediate said valve means and said relay means, and a restrictor means disposed intermediate said valve means and said accumulator means, the improvement wherein said regulating means also has means that is remote from said relay means and senses the pressure value in said pilot input at a point intermediate said accumulator means and said relay means.

4,576,195

CARTRIDGE TYPE CONTROL VALVE WITH INVERTED J-SHAPED INLET DUCT

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co. (H&H Precision Prod. Div.), Cedar Grove, N.J.

Filed Mar. 13, 1985, Ser. No. 711,295
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **5 Claims**



1. A cartridge type control valve for use in a fluid dispensing system, including a cup-like member having a bottom wall and a side wall defining a fluid transfer chamber, the combination with said cup-like member of, an inlet duct comprising,

a. a tubular member formed into a J-shaped configuration having an elongated inlet leg and an outlet leg continuous with said inlet leg,

b. said outlet leg defining an outlet port at the end remote from the inlet leg,

c. the inlet leg at the end remote from the outlet leg stacked into the bottom wall of the cup-like member a predetermined distance from the side wall so that a portion thereof projects to the exterior of the bottom wall to form an inlet port for the inlet duct,

d. said inlet duct disposed in assembled position in the cup-like member in inverted position and the outlet leg cantilevered so that the outlet port lies in the longitudinal centerline of the control valve and faces the bottom wall of the cup-like member,

e. reenforcing means in said control valve to prevent misalignment of the outlet port in assembled position,

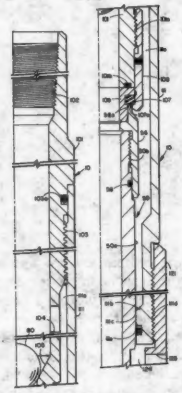
f. said reenforcing means comprising, an inwardly directed indentation in the side wall of the cup-like member sized for intimate contact with the inlet duct.

4,576,196

UNLOADING INJECTION CONTROL VALVE

Richard J. Ross, and David J. Speller, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Continuation-in-part of Ser. No. 535,409, Sep. 26, 1983. This application Feb. 25, 1985, Ser. No. 704,606
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—508 **11 Claims**



7. Fluid pressure responsive valving apparatus for use with an annular downhole tool having a packing element responsive to a pressure differential between the bore of the tool and the surrounding annulus within the well bore, comprising; a tubular assembly connectable in series relation between a surface-connected well conduit and the downhole tool; removable plug means for closing said tubular assembly for permitting fluid pressure within said tubular assembly to be increased; a valve mounted in said tubular assembly and shiftable from a first position to a second position in response to increased fluid pressure within said tubular assembly; said valve in said first position connecting the bore of said tubular assembly to the annulus; resilient means urging said valve to said first position; said valve in said second position directing conduit fluid pressure into the bore of the downhole tool to expand the packing element thereof; and means responsive to the conduit fluid pressure for shifting said valve to said second position against the bias of said resilient means.

4,576,197

PUMP SUCTION VACUUM LIFT VORTEX CONTROL

Eugene K. Kempers, Sioux City, Iowa, assignor to Midwest Energy Services Company, Sioux City, Iowa

Filed Sep. 29, 1982, Ser. No. 426,905
Int. Cl.[4] E03B *11/00*
U.S. Cl. 137—565 **9 Claims**

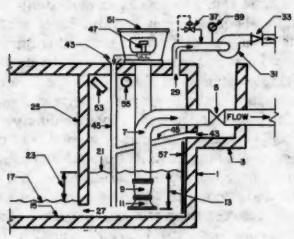
1. A suction pump vortex control system which comprises:

a. means defining an enclosure having at least one opening to a fluid reservoir and with other openings sealed from the atmosphere,

b. vacuum lift wall means in the enclosure communicating sealably with the other walls of the enclosure to form a pumping chamber wherein said wall means includes said at least one opening into the chamber and being disposed below the surface of the reservoir between said chamber and said fluid reservoir,

c. a suction pump intake positioned in the enclosure above the bottom of the chamber of said enclosure for a pump

connected to said intake which has a required submergence depth for prevention of vortexing,



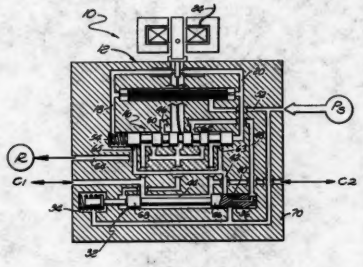
d. means for introducing and maintaining a vacuum in said chamber which is sufficient to lift the fluid level in the enclosure to the required submergence depth of the pump while fluid is pumped.

4,576,198

SERVOVALVE WITH INTEGRATED FAILURE MONITORING

James L. Coakley, Fillmore, Calif., and Richard J. Haydt, deceased, late of Los Angeles, Calif. (by Mette Haydt, legal representative), assignors to HR Textron Inc., Valencia, Calif.

Filed May 8, 1984, Ser. No. 608,328
Int. Cl.[4] F15B *13/043, 20/00*
U.S. Cl. 137—596 **8 Claims**



8. In an electrohydraulic control valve system for applying hydraulic fluid from a pressurized source thereof to a load responsive to electrical signals applied to the torque motor of said electrohydraulic valve through first and second ports controlled by a control spool valve, said source including a return, an integrated hydromechanically operated mechanism for sensing failures and deactivating load control responsive thereto comprising:

failure detection means including valve means disposed to provide fluid under pressure from a source thereof to said control valve,

means biasing said torque motor so that upon application of non-operative electrical input signals thereto said control valve moves to a limit position indicative of a failure; and

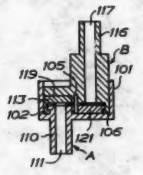
means including said control valve for connecting said failure detection means to said return responsive to said control valve moving to said limit position thereby to deactivate load control.

4,576,199

SLIDE VALVE AND COUPLING UNIT

Jan A. Svensson, Solhemsgatan 12, Huskvarna, Sweden (S-561 35), and Robert Axelsson, P.O. Box 4010, Huskvarna, Sweden S-561 04

Filed Mar. 12, 1984, Ser. No. 588,533
Claims priority, application Sweden, Dec. 19, 1983, 8307017
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 **4 Claims**



1. Slide valve and coupling unit for flow control, comprising a slide valve including a valve housing forming a first fluid flow passage, and a first slide valve element in said valve housing, guided for lateral displacement between a closed position in which the first slide valve element is positioned across said first passage to keep it closed, and an open position in which said passage is uncovered by said first slide element; and a coupling element including a coupling housing forming a second fluid flow passage which can be connected to said first passage, a second slide valve element in said coupling housing, guided for displacement between a closed position in which the second slide valve element is positioned across said second passage to keep it closed, and an open position in which said second passage is uncovered by the second slide element, said coupling housing also forming a recess to receive therein at least the portion of the valve housing containing the first slide valve element, a sealing element located in the coupling housing around the opening of said second fluid flow passage, said valve housing being displaceable in relation to the coupling housing to a displaced position to engage said second slide valve element for displacement thereof to the open position, and forming an interface surface to be engaged by the sealing element at said surface in said displaced position, said valve housing further including means for retaining the first slide valve element in said recess during the displacement of the first slide valve element, a sealed fluid flow connection being established through said first and second fluid flow passages in said displaced position.

4,576,200

HYDRAULIC PRESSURE REDUCING CONTROL VALVE

James P. Janecke, Waukesha, and Kishor J. Patel, Mukwonago, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Mar. 26, 1985, Ser. No. 716,037
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—624.13 **11 Claims**

1. A pressure reducing hydraulic control valve comprising:

an elongate valve body having a spool receiving bore, said bore having a longitudinal axis and first and second ends;

a hydraulic chamber at a first end of said bore;

a fluid inlet to said bore for admitting hydraulic fluid under pressure thereto;

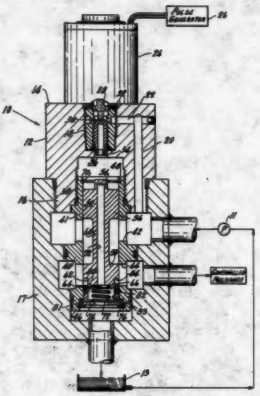
a fluid outlet from said bore;

a spool means slidably disposed within said bore, said spool including a first land adjacent said chamber, a second land located intermediate the ends of said spool means, said second land being constructed to selectively control the pressure within said outlet depending on the axial displacement of said spool means;

means for selectively controlling the hydraulic pressure within said chamber and hence the hydraulic pressure

acting upon the area of said first land exposed to said chamber;

means for biasing said spool means toward said chamber whereby said second land prevents the passage of hydraulic fluid from said fluid inlet to said fluid outlet unless the pressure within said chamber exceeds a predetermined value;



cylindrical sleeve means disposed within the second end of said bore, said second end of said bore communicating with tank;

a reduced diameter portion of said spool means located at the end of said spool means remote from said first land and within said outlet, said portion having an outer surface adapted to form a sliding seal with the inner bore of said sleeve means when said spool is axially displaced toward said bore second end.

4,576,201

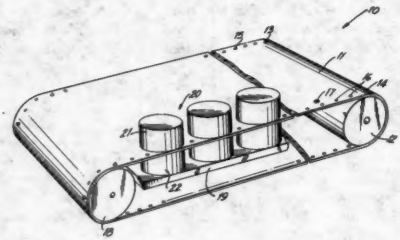
MULTI-PORT VALVE ASSEMBLY

S. Frederic Guggenheim, Teaneck, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1984, Ser. No. 672,229

Int. Cl.⁴ F15B *21/02*

U.S. Cl. 137—624.18 **8 Claims**



1. A multi-port valve apparatus comprising:

a base, a plurality of pairs of valve block means, each valve block means being adapted to conduct fluid through a bore therewithin, each valve block means having an orifice at the face of its bore, and having first and second seals surrounding its orifice;

each pair of valve block means being mounted on said base within the valve block means of each pair aligned so that their orifices are aligned, the valve block means face each other and they are positioned with a gap therebetween;

web means positioned in said gap and slidable therein, said web means being in sealing contact with said first and second seals of each pair of valve block means, said web means having at least one aperture therethrough;

each of said first and second seals respectively comprising an "O" ring positioned in a groove in the face of said valve block means, sealingly engaged therewith, and a washer seal also positioned in said groove, sealingly engaged with said "O" ring and with said web, said "O" ring and said washer seal being elastomeric, and compression of said "O" ring urges said washer seal against said web;

said first and second seals being positioned such that the distance between them is at least as great as the size of said web aperture, said size being measured in the direction coincident with the direction of motion of said aperture;

motor means to move said web means in order to progress its aperture from alignment with the orifices of one pairs of valve block means and into alignment with the orifices of a different pair of valve block means.

4,576,202

MIXING VALVE

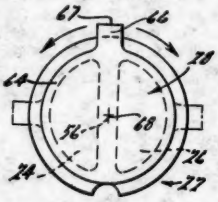
Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

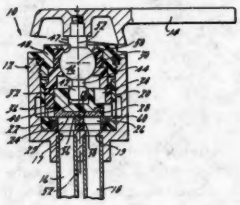
Filed Jul. 12, 1983, Ser. No. 513,109

Claims priority, application Italy, Jul. 16, 1982, 67906 A/82; Jan. 28, 1983, 67096 A/83; Mar. 7, 1983, 67253 A/83

Int. Cl.⁴ F16K *11/06*

U.S. Cl. 137—625.17 **6 Claims**





1. A flow control mixing valve characterized by:

a housing structure; a fixed plate being operatively fixed within said housing structure, having an upper surface, and having at least two openings for the passage of a first and second fluid respectively; a movable plate having a lower surface positioned in sliding contact with said upper surface of the fixed plate and cooperating with said openings of the first plate for adjusting the flow of said first and second fluid, respectively; a control mechanism operatively connected to said movable plate for moving said valve plate in both a translational mode and rotational mode for a limited angle between closed and open positions and first and second end positions;

the movable plate having its lower surface free from open-

ings and recesses, said valve plate having a center portion with a basic configuration free from concave sides and concave angles, said valve plate center portion sized to cover said openings when in said closed position independently of the position of said valve plate between said first and said second end positions; said valve plate being free of any projection that spans more than approximately one-half the perimeter of said valve plate center portion;

said control means translationally moving said movable plate between said closed and open positions and rotating said plate between said first and second end positions;

said movable plate having its lower surface shaped and cooperating with said openings such that the angle of rotation between the first and second end positions is approximately ninety degrees or greater;

said movable plate having a circular center portion covering said openings when said valve is in said closed position;

a toothed projection extending from said center portion; and

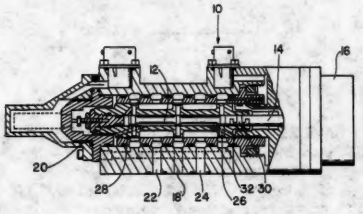
said toothed projection covering a portion of one of said openings when said valve is in an open position and slidable to a position not covering said one opening when said movable plate is rotated at approximately a midpoint between said first and second end positions while simultaneously said center portion covers approximately an area equal to or greater than the area uncovered by said toothed projection.

4,576,203

PRESSURE-OPERATED ECCENTRIC SHAFT COUPLING

Kent R. Boyer, Valencia, and Clyde E. Cobb, Lakeview Terrace, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed May 15, 1984, Ser. No. 610,531
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—625.63 **9 Claims**



1. In a fluid pressure operated valve having a separate drive member and a separate driven member having juxtaposed ends, each of said members being reciprocally movable, the driven member controlling fluid flow responsive to signals applied to the drive member the improvement for coupling the drive and driven members comprising:

(A) a first recess having opposed side walls and a bottom wall disposed transversely of the longitudinal axis of said drive member and displaced from the end thereof;

(B) a second recess having opposed side walls and a bottom wall disposed transversely of the longitudinal axis of said driven member and displaced from the end thereof;

(C) a unitary coupler means including first and second arms for insertion into said first and second recesses;

(D) a cavity defined by said valve;

(E) a source of fluid under pressure; and

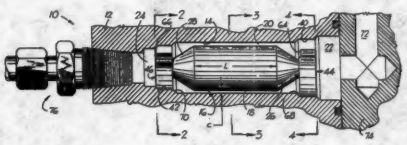
(F) means connecting said cavity to said source of fluid during operation of said valve, said coupler means and the ends of said members being disposed in said cavity for placing said coupling under tensile preload to prevent backlash between said drive and driven members.

4,576,204

LAMINAR FLOW ELEMENT

Edward A. Smallhorn, and John B. Oliver, both of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 9, 1984, Ser. No. 587,830
Claims priority, application Canada, Aug. 31, 1983, 435,759
Int. Cl.[4] F16L *1/02, 1/06*
U.S. Cl. 138—44 **5 Claims**



1. A laminar flow element for use in a cylindrical fluid passage for providing a constant volume rate of flow through said passage for a predetermined pressure differential range across said element, said element comprising:

a primary body portion having a cylindrical peripheral surface of predetermined length and predetermined diameter, said surface defining with said cylindrical fluid passage an annular fluid passage when said body portion is disposed in said cylindrical fluid passage;

fluid directing means extending axially from opposite ends of body portion for smoothly directing fluid flow in said cylindrical fluid passage to and from said annular passage, said fluid directing means including a tapered body portion extending axially from each end of said primary body portion, each tapered body portion having a base adjacent said primary body portion;

maintaining means extending from said element for engaging with a surface in said cylindrical fluid passage for maintaining said peripheral surface concentrically disposed within said cylindrical fluid passage, said maintaining means including a disc-shaped body portion extending axially from an end of each said tapered body portion remote from said primary body portion, each said disc-shaped body portion having axial fluid passage means extending therethrough for communicating said cylindrical fluid passage and said annular passage;

said predetermined length and said predetermined diameter being dimensioned such that fluid passes through said annular passage at a volume rate of flow which is linearly proportional to a pressure drop along said annular passage.

4,576,205

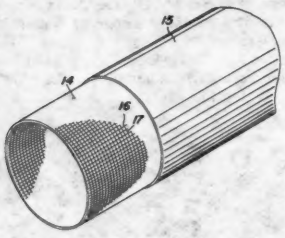
TUBULAR LINING MATERIAL FOR PIPE LINES HAVING BENDS

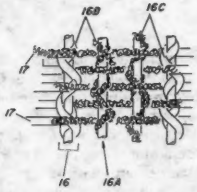
Akio Morinaga, Kanagawa; Yoichi Sakaguchi, Tokyo; Masakatsu Hyodo, and Isaburo Yagi, both of Osaka, all of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, and Ashimori Industry Co., Ltd., Osaka, both of Japan

Filed Apr. 18, 1984, Ser. No. 601,713
Claims priority, application Japan, Apr. 18, 1983, 58-68944
Int. Cl.[4] F16L *55/16*; B29C *27/16*
U.S. Cl. 138—98 **14 Claims**

1. A tubular lining material for pipe lines having bent or curved portions, which comprises a tubular textile jacket made of warps and wefts woven in a tubular form overlaid with a coating of a flexible synthetic resin and adapted to be applied to the inner surface of a pipe line having bends or curved portions in such a manner that the tubular lining material containing a binder disposed on the inner surface thereof is inserted into the pipe line and allowed to advance within the pipe line while turning the tubular lining material inside out through the application of fluid pressure to apply the tubular

lining material onto the inner surface of the pipe line with the interposition of the binder between the pipe line and the tubular lining material, wherein a part of the warps are composed of an elastic yarn around which at least one synthetic yarn is coiled over the full length of the elastic yarn.



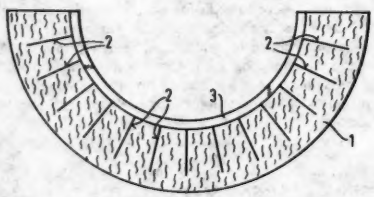


4,576,206

PIPE INSULATION SLEEVE

Henning J. E. Lauren, Regngagen 8, SF-21600 Parainen, Finland

Continuation-in-part of Ser. No. 394,286, Jul. 1, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,077
Claims priority, application Finland, Jul. 6, 1981, 812123
Int. Cl.[4] B32B *17/04*
U.S. Cl. 138—149 **3 Claims**



1. A pipe insulation sleeve of mineral wool bound by a thermosetting binder, comprising an outer insulating main layer having an inner diameter of at least 300 mm and a thickness of at least 100 mm, a surface forming the inner side of the main layer, and consisting of a slab of mineral wool hardened all through, said slab having a plurality of radial slits extending outwardly in an axial direction from said surface forming the inner side of the main layer, said slits being essentially closed, said surface being a slitted polygonal surface, and an inner layer of mineral wool compressed into contact with said main layer, said inner layer being free of radial slits and containing a thermosetting binder, said inner layer being bonded to said slitted polygonal surface of said main layer by said thermosetting binder, and wherein said binder has been hardened by a hot gas being blown through said inner layer after the said inner layer has been compressed into contact with the main layer, said inner layer having in its compressed condition a thickness of maximum 10–20% of the outer layer and a density in its compressed condition which is higher than the density of the main layer, thereby contributing to the rigidity of the sleeve.

4,576,207

TEXTURIZED HEAT SHRINKABLE TUBING HAVING RADIAL AND LONGITUDINAL SHRINKAGE MEMORY

Herbert R. Levine, Dover; Stephen G. Gerrato, Greenland, and Benoit L. Poulin, Hudson, all of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Feb. 11, 1983, Ser. No. 465,719
Int. Cl.[4] F16L *9/00*
U.S. Cl. 138—177 **1 Claim**

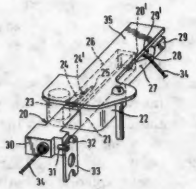
1. Heat shrinkable tubing comprising tubular polymeric material having radial shrinkage memory and about 5% to about 30% longitudinal shrinkage memory and having substantially parallel raised portions extending along its entire length, such tubing capable of shrinking in response to heat over bent, expanded and depressed substrate material in uniform, unwrinkled fashion while maintaining the substantially parallel raised portions extending along its entire length.

4,576,208

WEFT SEVERING DEVICE FOR A WEAVING MACHINE

Alois Steiner, Rieden, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 27, 1984, Ser. No. 675,235
Claims priority, application European Pat. Off., Dec. 1, 1983, 83.112063.9
Int. Cl.[4] D03D *47/00*
U.S. Cl. 139—429 **9 Claims**

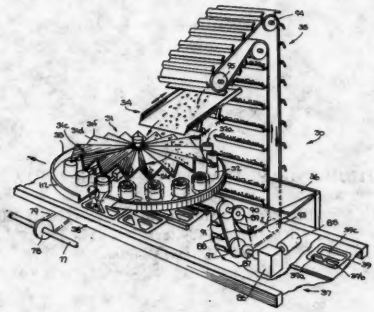


1. A weft severing device for a weaving machine comprising
a blowing tube for pneumatically conveying a to be inserted weft thread therethrough;
a cutting element for severing a weft thread extending out of said tube in cooperation with said blowing tube; and
means for moving at least one of said tube and said element relative to each other to effect severing of a weft thread between and by said tube and said element.

4,576,209
METHOD AND APPARATUS FOR DELIVERING A PREDETERMINED AMOUNT OF MATERIAL TO A CONTAINER

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Filed Feb. 6, 1985, Ser. No. 698,810
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—1 49 Claims



1. Apparatus for delivering a predetermined amount of material to a predetermined location comprising:

a turntable pivotally mounted about a substantially vertical axis, the turntable being crowned with the periphery thereof disposed lower than the central portion thereof;

means for depositing a flow of material upon the turntable inwardly of the periphery thereof, the material being adapted to move radially outwardly over the periphery of the turntable as the turntable rotates;

means for rotating the turntable about its pivotal axis;

a plurality of hoppers;

means for mounting the plurality of hoppers spaced apart from one another with the mouth of each hopper facing upwardly beneath the periphery of the turntable;

means for moving the plurality of hoppers in the direction of rotation of the turntable to enable each of the plurality of hoppers to receive material moving radially outwardly over the periphery of the turntable;

means located at a predetermined arcuate extent about the periphery of the turntable from a location in advance of the depositing means in the direction of rotation of the turntable for releasing material from each of the plurality of hoppers, the moving of the plurality of hoppers from adjacent the depositing means to adjacent the releasing means enabling each hopper to receive the predetermined amount of material from the periphery of the turntable.

4,576,210
DUCK BILL FILLER NOZZLE

J. George Lepisto, Middletown, Ohio, assignor to Champion International Corporation, Stamford, Conn.

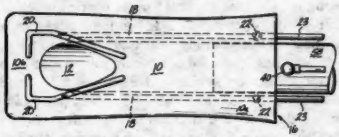
Continuation of Ser. No. 540,378, Oct. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 424,893, Sep. 28, 1982, Pat. No. 4,498,511. This application Jun. 17, 1985, Ser. No. 745,380
Int. Cl.[4] B65B *1/18*
U.S. Cl. 141—115 1 Claim

1. A nozzle for use in filling a bag having a valve sleeve, said nozzle comprising:

(a) a body member adapted for insertion into the valve sleeve, said body member having a material passage therethrough for passage of product into the bag, said body member being substantially rectangular in plan form, and said body member having a product discharge opening disposed at a discharge end of said body member, said discharge opening communicating with said material passage;

(b) at least one vacuum conduit in said body member, said vacuum conduit being operable to be connected to a vacuum source to allow drawing of a vacuum in said vacuum conduit;

(c) groove means comprising a pair of grooves flanking said



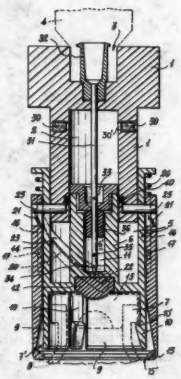
product discharge opening and formed in an outer surface of said body member, said groove means being connected to said vacuum conduit whereby said groove means is operable to distribute the vacuum drawn in said vacuum conduit to remove product residue from within the valve sleeve after the bag is filled; and

(d) means for removing residual product from said material passage after the bag is filled.

4,576,211
SAFETY DEVICE FOR CONNECTION OF A SYRINGE WITH THE MOUTH OR OPENING OF A BOTTLE CONTAINING A DRUG OR A SMALL TUBE FOR DRUG DELIVERY FROM THE SYRINGE

Luigi Valentini, Milan, and Mario Coccia, Cesano Boscone, both of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed May 7, 1984, Ser. No. 607,502
Claims priority, application Italy, Feb. 24, 1984, 19785 A/84
Int. Cl.[4] B65B *3/04;* A61M *5/00*
U.S. Cl. 141—329 8 Claims



1. A safety device for connection of a syringe to the mouth or opening of a bottle containing a drug or a small tube for drug delivery from the syringe, comprising an elongated inner body defining a cylindrical cavity, at one end of which a seat is formed for housing the free end of a syringe, an intermediate body having a hollow cylindrical extension which is housed and movable within the cavity of the inner body between a first end of stroke position defined by a retaining element limiting relative displacement of said inner body and said intermediate body in a first direction and a second end of stroke position defined by a retaining element limiting relative displacement of said inner body and said intermediate body in a second direc-

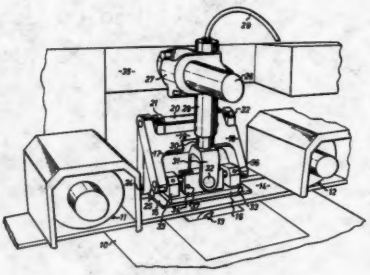
tion, opposite to the first direction, a shaped resilient plug sealingly closing the outward facing end of the cavity of said cylindrical extension, the other end of which opens into the cavity of the inner body, a housing seat for the mouth or opening of a bottle or a small tube formed at the free end of the intermediate body with said resilient plug projecting at the center of said seat, at least one flexible extension integral with said intermediate body and having a shaped portion thereof projecting to said housing seat for the bottle mouth or opening, an outer body superimposed to said intermediate and inner bodies, members restraining said outer body to the intermediate body enabling a mutual displacement between a position at which said extension is allowed to outwardly deflect, and a position at which the outer body interferes with said extension preventing the outward deflection thereof, elements restraining both said outer body and said intermediate body to the inner body, enabling the axial displacement of said outer body and said intermediate body relative to the inner body only when the outer body is located at the position at which it interferes with said extension preventing the outward deflection thereof, the cavities of said intermediate and inner bodies being adapted to house a hollow needle which can be connected to a syringe inserted in said seat of the inner body, the tip of said needle being positioned adjacent said resilient plug at the inoperative condition of the device and the top of said needle protruding through said resilient plug at the operative condition of the device.

4,576,212

DEVICE IN A MACHINE TOOL FOR MAINTAINING A WORKPIECE DISPLACED IN ITS LONGITUDINAL DIRECTION, IN ENGAGEMENT WITH THE TOOL

Bengt Andersson, Halmstad, Sweden, assignor to Waco Jonserreds AB, Halmstad, Sweden

Filed Mar. 9, 1984, Ser. No. 588,112
Claims priority, application Sweden, Mar. 15, 1983, 8301382
Int. Cl.[4] B27C *5/02*
U.S. Cl. 144—243 **6 Claims**



1. In a machine tool a device for maintaining a workpiece which is displaced in its longitudinal direction in engagement with the tool, comprising in combination

a machine frame,

a pressure plate,

two arms,

said arms being rigidly interconnected by an intermediate member, means for horizontally and vertically adjustably mounting the arms on the machine frame comprising a bearing means on the machine frame mounting said arms about an axis extending in the direction of movement of the workpiece,

said arms being pivotally connected at one end to said pressure plate,

a first bearing shaft on said pressure plate extending in said direction of movement, and

a pressure-exerting assembly,

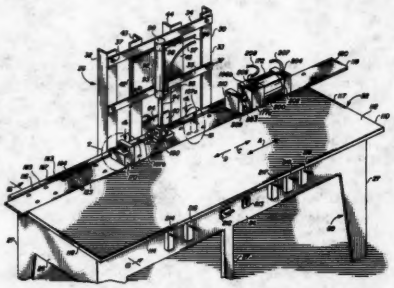
said assembly being horizontally adjustable mounted on said frame transversely of said direction of movement and pivotally connected to said pressure plate by means of said bearing shaft to exert a pressure on said pressure plate on the side thereof facing away from the tool.

4,576,213

METHOD AND APPARATUS FOR MACHINING A DOOR OR THE LIKE

Frank A. Miller, 4347 E. Maldonado, Phoenix, Ariz. 85040

Filed Jun. 4, 1984, Ser. No. 617,302
Int. Cl.[4] B27M *1/00*
U.S. Cl. 144—371 **41 Claims**



1. An apparatus for receiving a workpiece, which workpiece includes:

first and second sides,

first and second lateral edges, and

a longitudinal edge,

and for forming a recess into said longitudinal edge at a predetermined location, said apparatus comprising:

a. a stationary base;

b. a support means carried by said base for locationally holding and supporting said workpiece, said support means being reciprocally movable in opposite first and second directions along an axis substantially parallel to the longitudinal edge of said workpiece when locationally held;

c. milling means carried by said base for forming a recess into the longitudinal edge of said workpiece; and

d. positioning means for locating said support means at a preselected location along said axis relative to said said milling means.

30. The method of forming a recess of selected length into a longitudinal edge of a workpiece, which workpiece further includes

first and second sides, and first and second lateral edges, said method comprising the steps of:

a. securing said workpiece to a support means;

b. positioning said support means at a preselected location relative a milling means having a cutting tool;

c. moving said milling means in a direction whereby said cutting tool intercepts said workpiece and cuts said recess into said longitudinal edge.

4,576,214

NON-SKID DEVICE, PARTICULARLY FOR PNEUMATICALLY TIRED VEHICLE WHEELS USED ON ICE AND SNOW

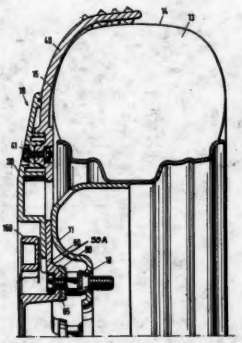
Werner Preusker, Atzelgift, Fed. Rep. of Germany, assignor to Niveau AG, Basel, Switzerland

Filed Jan. 5, 1984, Ser. No. 568,492

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331855; Sep. 23, 1983, 8327385

Int. Cl.[4] B60C *27/00*

U.S. Cl. 152—213 A 5 Claims



1. A non-skid device, particularly for pneumatic tires mounted on vehicle wheels for use on ice and snow, comprising a supporting disk arranged to be fixed to a wheel disk or rim of a vehicle wheel having a central axis about which the wheel rotates, said supporting disk having a plurality of equiangularly spaced, radially outwardly extending non-skid arms provided with a prebent profile so that said arms extend outwardly from said supporting disk to the circumferential periphery of the tire on the wheel and then are bent and project inwardly over the tire tread, said arms carrying thereon spike-like profiles arranged to extend over and outwardly from the tread, said arms being formed of a resilient elastic material, said anti-skid arms being pivotally mounted on said supporting disk for pivotal movement in a small range about axes parallel to the axis of the wheel; and further comprising

(a) a circular fixing disk arranged for fixing said supporting disk to the wheel, said fixing disk having a central axis extending transversely of said fixing disk, said fixing disk having a plurality of openings therethrough, means positionable within the openings in said fixing disk for securing said fixing disk to the wheel, said fixing disk having a radially outer diameter, said fixing disk having an outwardly facing surface, extending transversely of said fixing disk central axis, said fixing disk includes a centrally located circular hub having a smaller diameter than the radially outer diameter of said fixing disk and projecting outwardly from said outwardly facing surface of said fixing disk, said hub having a plurality of bulge-like shoulders spaced circumferentially apart on said hub and spaced in the axial direction of said fixing disk from the outwardly facing surface of said fixing disk, each said bulge-like shoulder forming a sliding and guiding path located inwardly between said shoulder and said outwardly facing surface of said fixing disk and each of said paths extending in the circumferential direction of said hub, said sliding and guiding paths each having an insertion opening and an end area spaced apart in the circumferential direction of said hub with each said path having a wedge-like shape converging inwardly from the insertion opening toward the end area in the circumferential direction around said hub, a retaining ring mounted on said hub for securing said supporting disk thereon, said retaining ring having a radially inner wall surface with locking webs formed on the radially inner wall surface and each said locking web being insertable into a corresponding said sliding and guiding path for effecting a bayonet-like engagement of said retaining ring in said paths, each said locking web being tapered inwardly in the circumferential direction extending from the insertion opening toward the end area of the corresponding said sliding and guiding path, said retaining ring having at least one leaf spring latch formed on the inner wall surface thereof, said hub having at least one first recess in the outer circumferential surface thereof, said latch being displaceable generally in the radial direction relative to the axis of the wheel between a locked position in engagement within said at least one first recess in said hub and an unlocked position, said first recess having a stop member therein for engagement by said latch in the locked position, said retaining ring having a second recess therein aligned opposite said first recess in said hub so that in the unlocked position said latch can be displaced into said second recess;

(b) said supporting disk being fitted on said hub of said fixing disk with a certain clearance therebetween so that said supporting disk can perform eccentric rotary movements about said hub; and

(c) said inner surface of said retaining ring is provided with two equiangularly spaced said leaf spring latches with said latches being pivoted in the locked position into corresponding said first recesses in said hub and in the unlocked position being displaceable into said second recesses in the inner wall face of said retaining ring, a key is arranged for displacing said leaf spring latches between the locked and unlocked position and said key comprises a grip-like handle having a first end and a second end, two laterally spaced pressure tongues located on the first end of said handle and extending generally perpendicular to said handle, and said pressure tongues being spaced apart corresponding to the spacing of said leaf spring latches.

4,576,215

METHOD FOR THE PRODUCTION OF FROZEN MOULD BODIES AND APPARATUS FOR USE IN THE CARRYING OUT OF THE METHOD

Hakon Kanserud, Ballerup, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

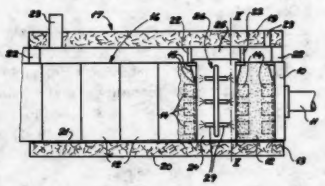
PCT No. PCT/DK82/00027, § 371 Date Dec. 8, 1982, § 102(e) Date Dec. 8, 1982, PCT Pub. No. WO82/03580, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 7, 1982, Ser. No. 448,897

Claims priority, application Denmark, Apr. 13, 1981, 1663/81

Int. Cl.[4] B22C *9/00*

U.S. Cl. 164—15 8 Claims



1. A method of producing a frozen mould body which includes granular material and a binder, which comprises the steps of:

forming the mould body of the granular material and the binder in a moulding apparatus which defines a mould cavity and which includes a plurality of separate mould parts, a first one of the mould parts being in the form of a movable pattern plate for forming impressions in the adjacent face of the mould body;

introducing a freezing agent into the mould cavity through the movable pattern plate; and

simultaneously applying a vacuum to at least part of an outer wall portion of a second mould part to draw the freezing agent into the mould body in the mould cavity so as to freeze the binder in the mould body.

4,576,216

PROCESS FOR MANUFACTURING INVESTMENT MOLDS

Giorgino Perna, Turin, Italy, assignor to Newellpharma s.r.l., Turin, Italy

Filed Nov. 8, 1984, Ser. No. 669,295

Claims priority, application Italy, Nov. 8, 1983, 68159 A/83

Int. Cl.⁴ B22C *15/20*; B28B *7/36*

U.S. Cl. 164—21 **6 Claims**

1. In a process for manufacturing an investment mold of refractory material for casting metal alloys comprising applying a layer of a paste composition to the inner surface of a metal container prior to forming the mold therein, wherein said layer is suitable for separating said mold from said container; the improvement comprising, as said paste composition,

(A) an organic component which can be eliminated by thermal degradation at a temperature above 200° C., and

(B) a powdered, refractory-mineral component which is stable at the casting temperature of said alloy used in said casting process.

4,576,217

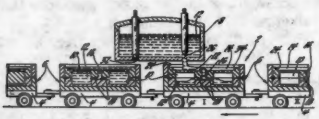
STATIONARY CONTINUOUS AUTOMATIC POURING PROCESS

Daniel Shaw, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 348,287, Feb. 12, 1982, Pat. No. 4,509,578. This application Jul. 2, 1984, Ser. No. 627,222

Int. Cl.⁴ B22D *23/00*

U.S. Cl. 164—130 **4 Claims**



1. A method of pouring metal melt into each of a plurality of successive molds moving substantially continuously through a pouring zone comprising the steps of:

passing said molds successively beneath a series of pouring outlets for sequentially dispensing increments of said melt to each of said molds, said series having a first and a last outlet aligned substantially in the direction of said moving, and said molds each having a cavity for shaping the melt and an extended pouring basin aligned substantially in the direction of said moving for receiving the melt from said outlets and directing it into said cavity;

first pouring melt from said first outlet as said pouring basin moves beneath said first outlet, said first poured melt being sufficient only to partially fill said cavity;

discontinuing said first pouring before said pouring basin passes out from beneath said first outlet;

last pouring melt from said last outlet as said pouring basin moves beneath said last outlet, said last poured melt being sufficient to completely fill said cavity; and

discontinuing said last pouring before said pouring basin passes out from beneath said last outlet.

4,576,218

FEEDING DEVICE FOR INTRODUCING STEEL MELT INTO TWIN-BELT CASTERS

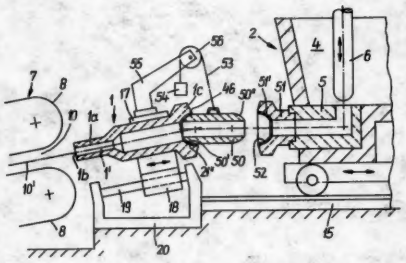
Gerd Artz, Ratingen; Gerhard Beckmann; Dieter Figge, both of Essen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 724,809

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415235

Int. Cl.⁴ B22D *11/02*

U.S. Cl. 164—431 **15 Claims**



1. A feeding device for introducing molten steel into a twin-belt caster having mold walls which move exclusively in the casting direction, said feeding device comprising: a casting unit including a pouring pipe having a mouthpiece at one end which can extend between and form a sealing gap with the mold walls of a twin-belt caster, a first carriage means disposed for movement toward and away from the locus of a twin-belt caster, and means for mounting said pouring pipe on said first carriage means so that said pouring pipe is rotatable about a horizontal pivot axis and is laterally adjustable transversely to its longitudinal extent; a tundish having an outlet; a second carriage means, disposed upstream of said first carriage means and independently moveable toward and away from said first carriage means, for supporting said tundish so that it is adjustable in height; and means for connecting said outlet of said tundish to the other end of said pouring pipe to permit molten steel to flow from said tundish through said pouring pipe, said connecting means including a compensating pipe having first and second sealing surfaces at its opposed ends, first sealing means, including said first sealing surface and a cooperating correspondingly shaped sealing surface on the other end of said pouring pipe, for sealingly connecting said compensating pipe to said pouring pipe such that said first sealing surface and said sealing surface on said pouring pipe are moveable relative to one another, and a second sealing means, including said second sealing surface and a correspondingly shaped sealing surface at said outlet of said tundish, for sealingly connecting said compensating pipe to said tundish such that said second sealing surface and said sealing surface on said tundish are moveable relative to one another.

4,576,219

MOLTEN METALS FILTER APPARATUS

Stuart Z. Uram, Alpine, N.J., assignor to Certech Incorporated, Wood-Ridge, N.J.

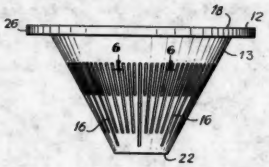
Filed Oct. 22, 1982, Ser. No. 435,980

Int. Cl.⁴ B22C *9/08*

U.S. Cl. 164—358 **5 Claims**

1. A molten metal filter apparatus comprising: a hollow frusto-conical strainer means for selectively restraining particulant impurities in molten metal, said strainer means having a plurality of slot apertures disposed longitudinally about its conical surface and an inlet port, said slot apertures being of

uniform width and of staggered lengths so that there are relatively fewer slots which extend to the smaller diameter portion



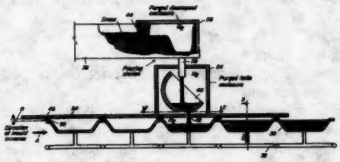
of said strainer means than which extend to the larger diameter portion of said strainer means.

4,576,220

METHOD AND APPARATUS FOR MAINTAINING AN ATMOSPHERE AROUND A PREDETERMINED PORTION OF AN ENDLESS DISCRETE OBJECT CONVEYOR

Laurence C. Smyth, Beaconsfield, and George Deep, Pointe-Claire, both of Canada, assignors to Noranda Inc., Toronto, Canada

Filed Dec. 23, 1983, Ser. No. 564,823
Int. Cl.[4] B22D *7/00, 23/00*
U.S. Cl. 164—66.1 **16 Claims**



1. An apparatus for maintaining a particular atmosphere above a predetermined portion of a train of closely spaced open top containers mounted on an endless conveyor chain, comprising:

(a) a cover plate located above a number of said containers and extending before and after said predetermined portion at a predetermined gap height between the top edge of each of the containers and the plate all around each container;

(b) a plurality of ports longitudinally spaced in said cover plate so that there is always at least one port over each container as the train of containers moves underneath the cover plate; and

(c) means for feeding a gas through the ports in said cover plate to progressively develop a particular atmosphere in said containers as they approach the predetermined portion of the endless conveyor and to maintain said atmosphere in the containers as they pass through said predetermined portion without the use of contacting seals between the containers and the cover plate.

5. An apparatus for maintaining a particular atmosphere above a predetermined portion of a train of closely spaced open top containers mounted on an endless conveyor chain, comprising:

(a) a cover plate located above a number of said containers and extending before and after said predetermined portion at a predetermined gap height between the top edge of each of the containers and the cover plated all around each container;

(b) a plurality of ports longitudinally spaced in said cover plate so that there is always at least one port over each container as the train of containers passes underneath the cover plate;

(c) manifold means attached to said ports, and

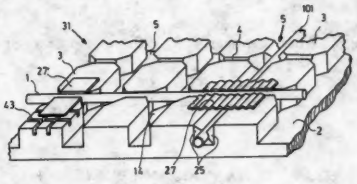
(d) a source of gas feeding a gas to said manifold means whereby said gas is fed through the ports in said cover plate to progressively develop a particular atmosphere in the containers as they approach the predetermined portion of the endless conveyor, and to maintain said atmosphere in the containers as said containers pass through said predetermined portion without the use of contacting seals between the containers and the cover plate.

4,576,221

SYSTEM FOR TEMPERING A ROOM

Manfred Fennesz, Damböckgasse 4, A 1060 Vienna, Austria

Filed Nov. 21, 1983, Ser. No. 554,093
Int. Cl.[4] F24D *19/02*
U.S. Cl. 165—49 **15 Claims**



1. A construction for use in a temperature control system, comprising:

surface means for defining a surface, the surface including projections having tops and boundary surfaces, the surface having defined therein recess sections, each recess section being defined by boundary surfaces of the projections, at least one recess section being a channel-like interspace having an air inlet for entering air and an air outlet for permitting air to exit, the air flowing through the recess sections from the air inlet to the air outlet;

means for tempering extending within at least part of at least one of the recess sections; and

covering means for covering the tops of the projections;

boundary surfaces including parts spaced apart for defining clamping elements for clamping the tempering means, the boundary surfaces further defining baffle means for deflecting the flowing air within at least one recess section in which the tempering means extends for providing temperature equalization.

4,576,222

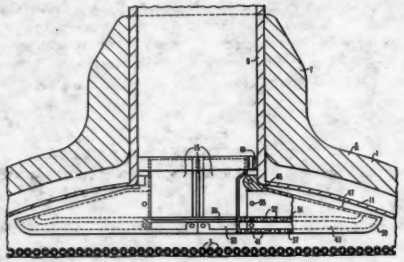
FLUID DISTRIBUTOR FOR HEAT EXCHANGER INLET NOZZLE

Samuel J. Granata, Jr., Greensburg, and John A. Rylatt, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,584
Int. Cl.[4] F28F *7/00, 9/22;* **F28D** *7/00*
U.S. Cl. 165—76 **8 Claims**

1. A flow distributor for an inlet nozzle of a shell and tube heat exchanger, said flow distributor comprising a plurality of vanes disposed in said inlet nozzle and radially with respect to the axis thereof so as to form a plurality of separate parallel fluid flow paths within said inlet nozzle, a plurality of enclosures separate from said shell, disposed within said shell, and connected to said vanes so that each separate parallel fluid flow path formed in said inlet nozzle is in communication with a separate enclosure, each enclosure having a plurality of apertures disposed in at least one wall of said enclosure in fluid communication with the shell portion of the heat exchanger and being disposed so that said apertures are directly adjacent said tubes the flow distributor being bigger than the inlet noz-

zle and the enclosures being separate and sized to fit through the nozzle whereby when within the heat exchanger the fluid



emitting from said apertures in the flow distributor flows directly on the tubes.

4,576,223

HEAT EXCHANGER AND PROCESS FOR ITS MANUFACTURE

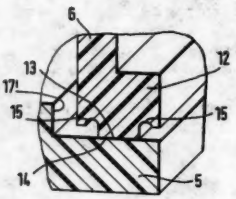
Bohumil Humpolik, Ludwigsburg; Vlastimil Kluna, Kornwestheim; Wilfried Winterer, Leinfelden; Reinhold Kuchelmeister, Waldenbuch, and Jürgen Bayer, Esslingen, all of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,819

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247502

Int. Cl.[4] F28F *9/26*

U.S. Cl. 165—79 **16 Claims**



1. A heat exchanger comprising:

at least one tube plate comprising synthetic resin material, said tube plate including one side having a plurality of projections, a plurality of orifices located, respectively, in said projections, and an edge area having a first continuous flat surface;

a plurality of tubes, said tubes having ends mounted, respectively, in said orifices, said tube ends being pressure fitted into said orifices;

a plurality of fins connected to said tubes, said fins and said tubes defining a heat exchanger block;

a water tank comprising synthetic resin material and having a rim with a second continuous flat surface resting on said first continuous flat surface of said tube plate;

a first vibration weld for connecting said first and second continuous flat surfaces, and disposed between the first and second surfaces;

at least one side groove formed along at least one of said flat surfaces, wherein said first vibration weld includes a weld bead disposed in said groove.

4,576,224

DIAMOND HEATSINK ASSEMBLIES

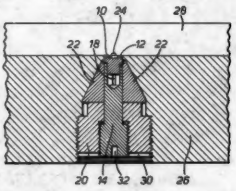
Ralph M. Eaton, and Michael W. Geen, both of Northampton, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 17, 1984, Ser. No. 651,466

Claims priority, application United Kingdom, Sep. 21, 1983, 8325320

Int. Cl.[4] H01L *23/40*

U.S. Cl. 165—80.2 **7 Claims**



1. A diamond heatsink assembly comprising:

(a) a mounting member including an outer surface in which is positioned a diamond;

(b) a holder member for holding said mounting member;

(c) a clamping member for securing said mouning member and said holder member, said clamping member being of split frusto-conical shape and including a base surface and a bore in which said mounting member and said holder member are inserted;

(d) a locking member; and

(e) a base member including

(i) a recess of corresponding shape to that of said clamping member and

(ii) first and second openings on respective sides of said recess, said first opening receiving said mounting member and said second opening receiving said locking member, said locking member axially movably positioned within said base member and adjacent said base surface of said clamping member for forcing said clamping member against said recess to clamp said clamping member against said holder member and to clamp said holder member against said mounting member to prevent rotation of said mounting member and to retain said mounting member with its outer surface substantially planar with a surface of said base member.

4,576,225

HEAT EXCHANGER FOR COOLING HOT GASES, ESPECIALLY THOSE DERIVING FROM THE SYNTHESIS OF AMMONIA

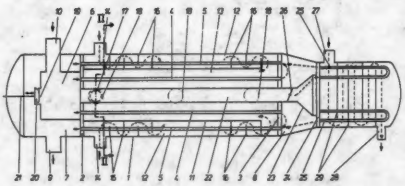
Konrad Nassauer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 639,994

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333735

Int. Cl.[4] F28F *27/02, 9/22;* **F28D** *7/00*

U.S. Cl. 165—101 **3 Claims**



1. Heat exchanger for cooling hot gases, particularly those

deriving from the synthesis of ammonia, by preheated and evaporating water, comprising: a shell with bundles of tubes positioned therein; tube sheets connected to said shell, said tubes being secured in said tube sheets; outlet and inlet means for gases to be cooled comprising an outgoing chamber and an incoming chamber inside said outgoing chamber, said chambers being connected to a first one of said tube sheets; partitions forming at least one chamber within said shell, a reversing chamber connected to a second one of said tube sheets; a first bundle of said tubes being secured in said second tube sheet connected to said reversing chamber; said first bundle of said tubes being connected between said reversing chamber and said incoming and outgoing chambers; a second bundle of said tubes being positioned inside said shell, said second bundle of said tubes having outgoing ends emptying into said reversing chamber; valve means for regulating relative quantities of gases passed to said first bundle of tubes and said second bundle of tubes; means for cooling said first bundle of tubes and said second bundle of tubes by different cooling mediums for regulating the temperature of gases leaving said outgoing chamber; a third tube sheet connected to said shell, tubes in said second bundle being secured in said third sheet, said third sheet in conjunction with said second sheet and said shell forming borders of said reversing chamber; a section of said shell surrounding said second bundle of tubes having connections for a separate medium to flow through; said incoming chamber being connected to said third tube sheet by a connecting pipe, said second bundle having tubes with incoming ends opening into said connecting pipe; said valve means positioned in said connecting pipe; said connecting pipe being positioned along a longitudinal axis of said shell; said first bundle of tubes comprising two separate cooling means and said second bundle of tubes comprising a third separate cooling means, each of said cooling means being located in a separate chamber within said shell and each having its own inlet means and its own outlet means for allowing different cooling media to be used in the chambers of said three cooling means, gases to be cooled being divided into two partial flows, one partial flow being passed through a first one of said three cooling means, said partial flows when united passing through a second one of said three cooling means, the other partial flow being also passed through a third one of said three cooling means, each partial flow being cooled separately before the partial flows after being united are cooled in common cooling means for varying the final temperature of the gases to be cooled between substantially wide limits; said incoming chamber having means for releasing a portion of uncooled gas to said outgoing chamber to increase further variability of said final temperature.

4,576,226

MULTIPASS CORROSION-PROOF AIR PREHEATER

Adolf U. Lipets, prospekt Lenina, 150 a, Kv. 38; Svetlana M. Kuznetsova, Revprospekt, 16, kv. 21; Vadim B. Galuskin, Juzhny proezd, 9, kv. 58; Jury I. Lafa, ulitsa Mashinostroitelei, 28b, kv. 58; Ivan A. Sotnikov, ulitsa Mashinostroitelei, 32, kv. 114; Vladimir G. Ovchar, ulitsa Parkovaya, 49, kv. 43, all of Podolsk Moskovskoi oblasti, and Alexei Z. Fedosov, ulitsa Burakova, 7, korpus 2, kv. 18, Moscow, all of U.S.S.R.

Filed Apr. 18, 1983, Ser. No. 486,073
Int. Cl.[4] F28F *19/00, 9/22*
U.S. Cl. 165—134.1 **11 Claims**

1. A multipass, corrosion-proof, air heater, comprising:

heat transfer tubes adapted to carry heating gases therein;

a plurality of ducts adapted to carry air to be heated, each duct being disposed about said heat transfer tubes;

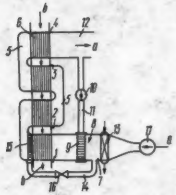
a plurality of passes for air to be heated, each such pass formed by a respective duct;

at least one connecting line, communicating with and interconnecting said plurality of passes in series;

a line for supplying air into a first one of said passes and communicating with said first pass;

a first heat exchanger for initially substantially pre-heating the air flowing through said supply line;

a second heat exchanger for further heating the air flowing through said supply line to a higher level, said second heat exchanger situated in said supply line downstream of said first heat exchanger in the direction of air flow through said supply line;



a bypass line communicating with said supply line at a point between said first and second heat exchangers, and communicating with said at least one connecting line; and

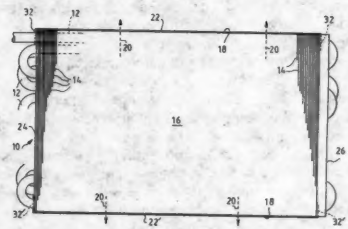
means for mixing air flowing through said bypass line with air flowing into said at least one connecting line from at least one of said plurality of passes, said mixing means being disposed in said at least one connecting line.

4,576,227

HEAT EXCHANGER, IN PARTICULAR FOR A MOTOR VEHICLE, AND SIDE SEALING DEVICE THEREFOR

Patrick Cadars, Montigny, France, assignor to Valeo, Paris, France

Filed Jun. 14, 1983, Ser. No. 504,144
Claims priority, application France, Jun. 29, 1982, 82 11419
Int. Cl.[4] F28D *1/00;* F28F *9/02*
U.S. Cl. 165—149 **8 Claims**



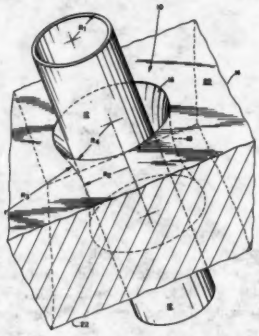
1. A side sealing device for a heat exchanger, in particular of the type intended for use in a motor vehicle and comprising a bundle of tubes fitted with fins, the tubes in the bundle having opposed ends, said bundle having first and second large faces for inlet and outlet of an external heat exchanger fluid and two opposite side faces lying parallel to the general direction of the tubes in the bundle, the improvement wherein the side sealing device comprises a plate substantially in the shape of an elongate rectangle having a longitudinal extent and opposed ends, and resilient snap-fitting means on said plate opposed ends for snap-fitting engagement with the tubes on the heat exchanger, said snap-fitting means comprising pivoted tabs at the opposed ends of the plate resiliently deformable to engage between the ends of the tubes in the bundle in a manner whereby the engaged snap-fitting means precludes movement of said sealing device relative to the heat exchanger independent of other means, said plate being engageable over one of said side faces of the bundle.

4,576,228

MINIMUM WEAR TUBE SUPPORT HOLE DESIGN

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 3, 1984, Ser. No. 576,679
Int. Cl.[4] F28F 1/00; F28D 7/00
U.S. Cl. 165—162 19 Claims



1. A heat exchanger, comprising:

a heat exchange tube, having a first diametrical extent, through which a first fluid is conducted in connection with a heat exchange process conducted within said heat exchanger; and

a tube support plate having means defining a circumferentially continuous through-bore integrally within said tube support plate so as to extend from the upper surface of said tube support plate to the lower surface of said tube support plate for passage therethrough of said heat exchange tube, said through-bore having a second diametrical extent which is substantially greater than said first diametrical extent of said heat exchange tube so as to define a passageway between said heat exchange tube and the sidewalls of said tube support plate defining said through-bore for flow therethrough of a second fluid in connection with said heat exchange process conducted within said heat exchanger and which permits substantial axial, radial, and angular relative movements between said heat exchange tube and said tube support plate,

said through-bore furthermore having an hour-glass shaped configuartion defined between said upper and lower surfaces of said tube support plate so as to substantially reduce and eliminate excessive wear upon said heat exchange tube as a result of said axial, radial, and angular relative movements being experienced between said heat exchange tube and said tube support plate.

4,576,229

DEVICE FOR FACILITATING RELEASE OF STUCK DRILL COLLARS

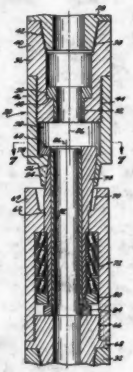
Robert L. Brown, Buena Park, Calif., assignor to DMI Wireline, Inc., Broussard, La.

Filed Jul. 20, 1984, Ser. No. 632,811
Int. Cl.[4] E21B 31/00
U.S. Cl. 166—177 22 Claims

1. A device adapted to be incorporated into a drill string used in subterranean drilling, for normally functioning as a rigid element capable of transmitting torsional force from a portion of the drill string which is disposed above the device to the portion of the drill string which is disposed below the device, and for facilitating release of stuck portion of the drill string, the device comprising:

first means for fixedly but removably mounting the device intermediately into the drill string to normally occupy a first operative position therein, the entire device being substantially concentric with the longitudinal axis of the drill string in said first operative position;

second means incorporated into the device for placing the device into a second operative position when a greater than predetermined substantially axial force is applied to the device, in the second operative position the portion of the drill string disposed above the device being off-center relative to the portion of the drill string disposed below the device, and



third means incorporated in the device to permit, in the second operative position, free rotation of the portion of the drill string disposed above the device relative to the portion of the drill string disposed below the device, whereby rotation of the portion above the device causes a camming action against walls of the bore hole and a vibration, said camming action and vibration facilitating release of stuck portion of the drill string below the device.

4,576,230

RETRIEVABLE SUBSURFACE WELL CASING SLIP AND PACKER APPARATUS AND METHOD

William T. Tapp, Rte. 2, Box 119E2, Yorktown, Tex. 78164, and Ranson R. Fullinwider, 15922 Haven Hills, Houston, Tex. 77084

Continuation of Ser. No. 555,945, Nov. 29, 1983, abandoned.
This application May 6, 1985, Ser. No. 731,592
Int. Cl.[4] E21B 23/00, 33/129
U.S. Cl. 166—382 14 Claims

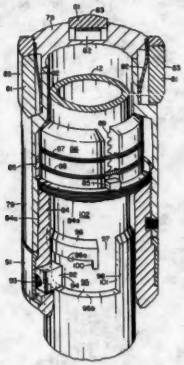
1. A method for running in, setting and retrieving a subsurface well conduit engaging apparatus comprising:

lowering the well conduit engaging apparatus into a well conduit to a desired location;

rotating the well conduit engaging apparatus in clockwise and counterclockwise directions without unlocking the engaging means for setting the apparatus in the well casing;

unlocking the engaging means for engagement with a well conduit by raising and then rotating an elongate support means upon which engaging means are mounted to position a radially biased key to its unlocked position for allowing relative longitudinal motion between the support means and the engaging means;

thereafter raising the support means to fully engage the well casing; and



relocking the engaging means from engagement with the well casing by raising the support means without rotation to position the key in its locked position.

4,576,231

METHOD AND APPARATUS FOR COMBATING ENCROACHMENT BY IN SITU TREATED FORMATIONS

Donald J. Dowling, Houston, and Harold A. Palmer, Nacogdoches, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,140
Int. Cl.[4] E21B *37/02, 36/04, 43/24*
U.S. Cl. 166—248 **12 Claims**

1. In radio frequency heating of oil shale or tar sand formations in situ wherein a central conductor and a coaxial shield are employed down hole,

a method of combating the encroachment of said heated formation, comprising

applying relative motion to said central conductor periodically for removing said encroaching formation.

5. In radio frequency heating of oil shale or tar sand formations in situ, in combination with

an applicator for electromagnetic propagation of radio frequency energy into said formation,

said applicator comprising a central conductor extending a predetermined distance beyond the end of a coaxial shielding conductor, and

a radio frequency generator for supplying said radio frequency energy to said applicator,

the improvement comprising means associated with said central conductor for moving it relative to said formation whereby encroachment by said formation may be prevented.

4,576,232

NON-CONDENSIBLE GAS INJECTION INCLUDING ALPHA-OLEFIN SULFONATE DIMER SURFACTANT ADDITIVES AND A PROCESS OF STIMULATING HYDROCARBON RECOVERY FROM A SUBTERRANEAN FORMATION

John H. Duerksen, Fullerton; Robert G. Wall, Pinole, and Jack D. Knight, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 24, 1983, Ser. No. 507,835
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **26 Claims**

1. A non-condensible gas process of recovering hydrocarbons from a subterranean formation in the absence of steam, wherein said formation is penetrated by at least one injection well and at least one production well, said process comprising:

(a) injecting a non-condensible gas and, including therewith and in the absence of steam, a sufficient amount of an alpha-olefin sulfonate dimer to form a non-condensible gas and alpha-olefin sulfonate dimer foam at an injection well;

(b) continuing to inject said non-condensible gas and alpha-olefin sulfonate dimer foam to assist the movement of hydrocarbons toward said production well, and

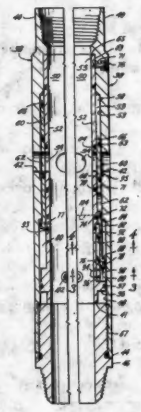
(c) recovering hydrocarbons from a production well.

4,576,233

DIFFERENTIAL PRESSURE ACTUATED VENT ASSEMBLY

Flint R. George, Katy, Tex., assignor to Geo Vann, Inc., Houston, Tex.

Filed Sep. 28, 1982, Ser. No. 425,626
Int. Cl.[4] E21B *43/112*
U.S. Cl. 166—297 **5 Claims**



1. A method of backsurging a well comprising the steps of:

(1) lowering a tubing string series connected with a vent assembly and a perforating gun into a well;

(2) filling the tubing string with a fluid to a predetermined level as the tubing string is lowered into the well thereby creating a hydrostatic head within the tubing string, the hydrostatic head being lower than an anticipated pressure in a portion of the well to be backsurged;

(3) passing fluid pressure from the hydrostatic head through a passageway in the vent assembly;

(4) applying the fluid pressure through the passageway onto a piston reciprocably mounted in the vent assembly;

(5) moving the piston from a closed position to an open position for opening a flow path between the interior and exterior of the tubing string; and

(6) detonating the perforating gun to perforate the well.

4,576,234

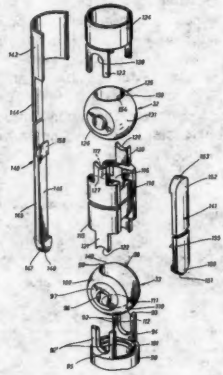
FULL BORE SAMPLER VALVE

James M. Upchurch, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 419,251, Sep. 17, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 727,609

Int. Cl.[4] E21B *34/10, 43/12*

U.S. Cl. 166—319 14 Claims



1. A well tool adapted to be connected in a pipe string and positioned in a well bore for collecting a sample of fluids within said pipe string and comprising: an outer tubular member:

first and second inner members cooperatively arranged within said outer member for defining an axial passage therein and enabling at least said first inner member to move longitudinally within said outer member;

valve means controlling communication through said axial passage and including first and second valve members cooperatively mounted on said first and second inner members and respectively arranged to pivot about a transverse axis between a passage-opening position and a passage-closing position, each of said valve members having an outwardly-facing opening bounded by first and second transverse edge portions that are spatially disposed on opposite sides of said transverse axis of that valve member and laterally offset therefrom;

pressure-responsive means cooperatively arranged for moving said first inner member longitudinally within said outer member;

first actuator means on said outer member and cooperatively arranged to be engaged with said first transverse edge portion of said first valve member upon longitudinal movement of said first inner member for rotating said first valve member to its said passage-closing position; and

second actuator means on said outer member and cooperatively arranged to be engaged with said second transverse edge portion of said first valve member upon rotation thereof toward its said passage-closing position and moved against said first transverse edge portion of said second valve member for rotating said second valve member to its said passage-closing position.

4,576,235

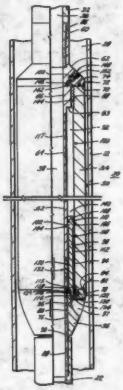
DOWNHOLE RELIEF VALVE

William B. Slaughter, Angleton, and Henry C. Haynie, Sr., Houston, both of Tex., assignors to S & B Engineers, Houston, Tex.

Filed Sep. 30, 1983, Ser. No. 537,969

Int. Cl.[4] E21B *34/10, 34/08*

U.S. Cl. 166—374 27 Claims



1. A well apparatus adapted for connection in series with a pipe string, the pipe string extending into a producing well and forming a casing annulus with the casing and having a flow passage therethrough for the flow of hydrocarbons through the pipe string to the surface, comprising:

a tubular member having connection means at each end for connection in series with the pipe string, said member having an outer barrel and an inner mandrel forming a chamber therebetween and having fluid communication means providing fluid communication through said barrel and mandrel and between the casing annulus and the flow passage;

said inner mandrel having an internal flow bore having a common inner diameter with the flow passage through the pipe string and being coaxial with the flow passage so as to become a part of the flow passage;

said barrel having an outer surface exposed to the well fluids in the casing annulus;

said chamber circumscribing the flow passage for the hydrocarbons;

barrier means for closing and opening said fluid communication means;

said barrier means responsive to an increase in the pressure in the casing annulus for opening said fluid communication means and allowing well fluids from the casing annulus to flow through said barrel and mandrel and into the flow passage to control the well.

23. A method for controlling a producing well having production tubing and casing extending downwardly therein and a packer sealing the annulus formed by the tubing and the casing, comprising the steps of:

series connecting a relief valve in the production tubing adjacent and above the packer;

closing a fluid passage in the relief valve extending between the flowbore of the tubing and the annulus;

running in the well the relief valve and the production tubing concurrently;

passing hydrocarbons through the relief valve and up the production tubing to the surface;

increasing the static head pressure in the annulus;

activating the relief valve;

increasing the magnitude of the hydraulic force exerted on the valve following activation of the valve;

opening said fluid passage;

flowing drilling fluids from the annulus into the flowbore of the tubing;

forming a flowbore static head pressure which is higher than the formation pressure thereby killing the well.

4,576,236

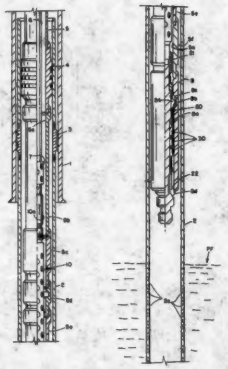
PERFORATION AND ISOLATION APPARATUS

Gregg W. Stout, Montgomery; John A. Nelson, Algernon Spring, both of Tex., and John H. Crisp, Aberdeen, Scotland, assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed May 10, 1984, Ser. No. 608,900

Int. Cl.[4] E21B *33/12*

U.S. Cl. 166—386 22 Claims



1. Apparatus for plugging a subterranean well conduit above a perforated zone, comprising: insertable means in the well conduit above the perforated zone; said insertable means defining a seal bore and a first upwardly facing shoulder above said seal bore and a second downwardly facing shoulder below said seal bore; a plug assembly comprising a central body portion carried by a work string; a downwardly extending sleeve assembly slidably and sealably mounted on said central body portion and secured to said central body portion by a first releasing means; sealing means mounted on the exterior of said sleeve assembly and cooperating with said seal bore in slidable, sealable relationship; means closing the bore of said sleeve assembly; a first radially shiftable latching means mounted on said sleeve assembly below said sealing means, said first latching means being freely passable in one direction through said seal bore and said second shoulder in said nipple but lockingly engagable with said second shoulder upon movement of said sleeve assembly in said nipple in another direction whereby an applied upward force to said central body portion releases said first releasing means; means including a second releasable means for connecting the upper portions of said central body portion to a work string; a second radially shiftable latching means mounted on said sleeve assembly and normally positioned in a retracted, inoperative position relative to said first shoulder; means for camming said second radially shiftable latching means outwardly to an engaged position with said first shoulder by upward movement of said central body portion relative to said sleeve assembly subsequent to release activation of said first releasing means, whereby said plug assembly is securely and sealably latched in said nipple and may be left in position by releasing said second releasing means.

4,576,237

FIRE FIGHTING BUCKET ASSEMBLY FOR AIRCRAFT

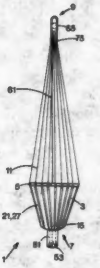
Donald B. Arney, Suite 1001, 2191 W. 39th Ave., Vancouver, British Columbia, Canada V6M 1T7

Continuation-in-part of Ser. No. 374,790, May 4, 1982, Pat. No. 4,474,245. This application Jul. 16, 1984, Ser. No. 631,083

Claims priority, application United Kingdom, Aug. 31, 1983, 8323286

Int. Cl.[4] A62C *28/00*

U.S. Cl. 169—53 23 Claims



1. A collapsible fire fighting bucket to be suspended from an aircraft and to be filled from an open body of water, the bucket having suspending means for suspending the bucket from the aircraft, a dump valve and associated valve operating means, the bucket being characterized by:

(a) an open bucket body made of pliable material and having an upper rim defining an upper opening, a side wall, and a bottom,

(b) upper rim stiffening means cooperating with the upper rim to maintain the upper opening at an essentially constant size so that the bucket remains open while operative,

(c) capacity adjusting means cooperating with the side wall for adjustably varying side wall circumference remote from the rim, so as to vary the capacity of the bucket with a negligible change in size of the opening, water within the bucket extending essentially all of the side wall axially for all capacities of the bucket so that there is a negligible change in length of the bucket as the capacity of the bucket is varied.

4,576,238

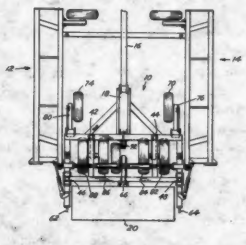
FOLDING OUTRIGGER ATTACHMENT FOR FARM IMPLEMENTS

Michael L. Spencer, Jonesboro, Ark., assignor to Marliss Industries, Inc., Jonesboro, Ark.

Filed Aug. 22, 1983, Ser. No. 525,118

Int. Cl.[4] A01B *73/00*

U.S. Cl. 172—311 9 Claims



1. A folding implement comprising, in combination:

a center carriage having ground engaging wheels to support the carriage;

at least one wing section cooperative with and hingedly attached to the carriage for pivoting the wing section between a field travel, extended position substantially transverse to the direction of carriage travel and a road travel, folded position substantially aligned with the direction of carriage travel;

means for connecting the wing section to the carriage, said means for connecting having an upstanding wing support member and a first hinge connection defining an axis substantially aligned with the direction of carriage travel, said first hinge connection connecting the carriage to the wing support member and defining means for pivoting the wing section to follow the contour of the ground independent of the carriage when the wing section is in the extended position;

said means for connecting further including a second hinge connection defining a substantially upright axis, said second hinge connection connecting the wing section to the wing support member and defining means for pivoting the wing section about the upright axis between the extended position and the folded position; and

a flexible linking member connected between the wing support member and the carriage including means for altering the length of the linking member, said linking member controlling the extent of pivotal motion of the wing support member about an axis substantially aligned with the direction of carriage travel and further providing cantilever support for the wing section when the wing section is in the folded position.

4,576,239

SCARIFIER TOOTH ASSEMBLY

Richard L. Launder, 8107 San Lucas Dr., Whittier, Calif. 90605

Filed Aug. 27, 1984, Ser. No. 644,627

Int. Cl.[4] E02F *9/28;* A01B *23/02*

U.S. Cl. 172—751 **15 Claims**

1. A scarifier tooth assembly adapted to be carried by a shank mounted on earth excavation equipment, said assembly comprising an integrally formed point defining a forward digging portion and a rear shaft portion, said shaft portion defining a lower flat elongated bearing surface adapted to mate with and bear against a portion of the shank and an upper curvilinear bearing surface, said point defining means integrally formed therewith and projecting therefrom for extending laterally about portions of the shank to prevent lateral movement of said point with respect to the shank upon said lower flat bearing surface being brought into a mating relationship with the shank, and an integrally formed clamp member defining a curvilinear interior bearing surface and flange means, said interior bearing surface being adapted to abut and mate with said upper curvilinear bearing surface on said shaft portion of said point, said flange means being adapted to engage the shank upon said clamp member being disposed about said shaft portion of said point and said curvilinear interior bearing surface being brought into abutment and mating relationship with said curvilinear bearing surface on said shank portion of said point such that upon urging said point and clamp member onto said shank, said shaft portion of said point is wedged between the shank and said curvilinear interior bearing surface of said clamp member thereby releaseably securing said point to said clamp member and said shank.

4,576,240

HYDRAULIC IMPACT DEVICE

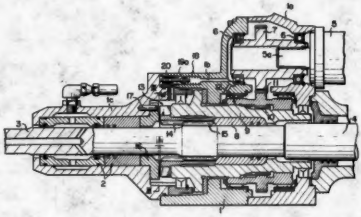
Minoru Matsumoto, Katano, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,247

Claims priority, application Japan, Oct. 19, 1981, 56-154055

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—105 **2 Claims**



1. A hydraulic impact device for rock drilling, comprising:

a housing comprising a main casing, a gear casing containing a lubricating fluid, and a cover removably mounted to said main casing;

an impact piston slidably mounted within said housing main casing;

hydraulic means for driving said impact piston;

a shank rod mounted within said removable housing cover, said shank rod being adapted to be struck at one end thereof by said impact piston;

motor means for imparting a rotary motion to said shank rod, said motor means being mounted to said housing;

a sleeve rotatably mounted around said shank rod and having a peripheral end face;

a chuck having a peripheral end face and being splined to said shank rod;

clutch means for engaging said sleeve with said chuck comprising a dog clutch positioned in a chamber of said main casing and formed by alternating projections and recesses on said peripheral end face of said sleeve and corresponding alternating projections and recesses on said peripheral end face of said chuck adapted to engage said alternating projections and recesses to said sleeve;

transmission means accommodated in a chamber of said gear casing for transmitting the rotary motion of said motor means to said sleeve;

a passage formed in said main casing between said gear casing chamber and said chamber accommodating said dog clutch; and

valve means mounted in said passage and operating to establish communication between said gear casing chamber and said dog clutch chamber when said cover is mounted to said main casing, and to block communication therebetween when said cover is removed from said main casing, whereby said lubricating fluid is introduced into said dog clutch chamber as long as said cover is mounted to said main casing.

4,576,241
TOOL ASSEMBLY AND HANDLE ASSEMBLY THEREFOR

Henri Emonet, 12 Rue R.P. Couturier, Montbrison (Loire), France

Filed Nov. 21, 1983, Ser. No. 553,409
Claims priority, application European Pat. Off., Feb. 3, 1983, 83420020.6
Int. Cl.[4] B25D *17/04*
U.S. Cl. 173—162 H 10 Claims

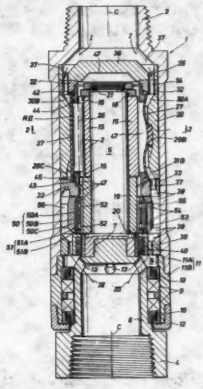
1. A tool assembly comprising:
a tool having a longitudinal axis;
a head fixedly interconnected with said tool;
first handle means having a first end pivotally interconnected with said head such as to pivot about a first pivot axis perpendicular to said longitudinal axis, and a second end opposite said first end;
second handle means formed non-integrally with said first handle means and having a first end pivotally interconnected with said head such as to pivot about a second pivot axis parallel to said first pivot axis and spaced away therefrom, and a second end opposite said first end, the plane of said first pivot axis being disposed between said first end and said second end of said second handle means, and the plane of said second pivot axis being disposed between said first end and said second end of said first handle means, whereby said first handle means crosses said second handle means, said first and second pivot axes together defining a plane perpendicular to said longitudinal axis;
first biasing means interposed said first handle means and said head and biasing said second end of said first handle means away from said head in a direction such that said first handle means extends from said first end towards said second end thereof in a direction generally towards said second pivot axis; and
second biasing means interposed said second handle means and said head and biasing said second end of said second handle means away from said head in a direction such that said second handle means extends from said first end towards said second end thereof in a direction generally towards said first pivot axis.

4,576,242
PERISTALTIC DOWN-HOLE DRILLING MOTOR

Richard H. Mundell, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 17, 1984, Ser. No. 641,636
Claims priority, application United Kingdom, Oct. 26, 1983, 8328633
Int. Cl.[4] E21B *3/12*; F04B *43/08*
U.S. Cl. 175—107 18 Claims

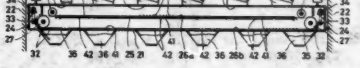
1. Peristaltic motor comprising motor parts including a stator suitable to be operatively coupled to the lower end of a drill string and a rotor suitable to be operatively coupled to a drill bit, said motor parts being rotatable relative to each other about a central axis, one of said motor parts comprising a co-axial tubular section and a single membrane being secured to said section in such a manner that therebetween a series of breathing working chambers are created, the other of said motor parts comprising a carrier body having grooves therein and a plurality of rollers of a number greater than the number of working chambers, each of said rollers contacting the membrane at regular intervals with said tubular section, wherein the rollers are rotatably supported in said grooves of the carrier body such that each roller is rotatable relative to said carrier body about an axis of rotation being substantially parallel to and at a fixed distance from the central axis of the motor.



4,576,243
METHOD AND APPARATUS FOR WEIGHING BULK MATERIALS

Masato Matsumoto, Osaka, Japan, assignor to Automatic Mechanical System Engineering Co., Osaka, Japan

Filed Apr. 27, 1984, Ser. No. 604,764
Claims priority, application Japan, Dec. 13, 1983, 58-236576[U]; Dec. 13, 1983, 58-193469[U]; Dec. 22, 1983, 58-198015[U]; Dec. 22, 1983, 58-198016[U]
Int. Cl.[4] G01G *13/02, 19/22, 23/14*
U.S. Cl. 177—119 8 Claims



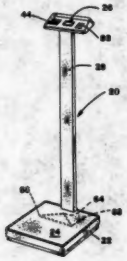
1. A method for weighing a bulk material, comprising the steps of:
supplying the material from a supply port disposed over a conveyor surface on to said conveyor surface until said supply port gets blocked by the material itself,
moving said conveyor surface so that the material will fall through said supply port continuously and so that the pressure applied by the material above said supply port to said conveyor surface will be constant and while measuring the weight of the material stacked on said conveyor surface, and
shutting said supply port as soon as the weight of the material reaches a predetermined value.

4,576,244

DIETER'S WEIGHING SCALE

Willard L. Zeigner, San Ramon, and John A. MacIntosh, Cupertino, both of Calif., assignors to Zemco, Inc., San Ramon, Calif.

Filed Feb. 23, 1984, Ser. No. 582,892
Int. Cl.[4] G01G 19/00, 19/22, 23/18, 23/38
U.S. Cl. 177—245 4 Claims



1. A talking electronic scale for encouraging the use of and adherence to a preset diet program, comprising:

weighing means for determining the weight of a person on the scale,

display means connected to said weighing means for displaying said weight,

comparison means for comparing his present weight, his most recent past weight, and his goal weight,

memory means connected to said weighing means for storing a goal weight for the person and his weight each time he weighs, along with the date of each stored weight, and a series of comments to be voiced,

voice synthesis means connected to said comparison means and said memory means for providing preselected said comments appropriate to said comparison,

audio means connected to said voice synthesis means for speaking those comments audibly to the user,

manually activated individual identification means, for use by the user in his first weighing of a diet program coupling his scale identify and initial weight and placing them in said memory means,

recognition means connected to said memory means for subsequently identifying that user each time he weighs by the relative closeness of his weight to his last previous weight, so long as he does not vary from that weight by more than a preselected amount, and

address means connecting said recognition means to said voice synthesis means so that the comments are addressed to the user audibly by stating his scale identity.

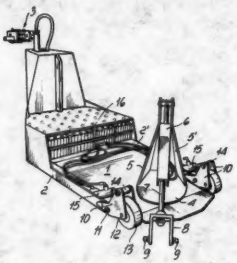
4,576,245

SELF-PROPELLED PEDESTRIAN-CONTROLLED TRACTOR FOR TOWING HELICOPTERS

Gaetano Oldani, Via Stromboli, 20, 20089 - Rozzano (Milano), Italy

Filed Mar. 1, 1984, Ser. No. 584,997
Claims priority, application Italy, Mar. 21, 1983, 21198/83[U]
Int. Cl.[4] B62D 51/04, 21/14; B64C 25/50
U.S. Cl. 180—14.1 1 Claim

1. In a self-propelled pedestrian-controlled tractor for towing helicopters comprising essentially a platform mounted on three wheels, one of which is a driving and steering wheel, the two other of said wheels being swivel mounted on the side of said platform by means of pairs of parallel shaped plates being pivotally connected and provided with bearings, said plates being connected by means of an upper cross member to double-acting hydraulic jacks, said drive wheel having an electromagnetic brake and being effective to move at a controllable speed under control by an electronic unit the controls whereof are accomodated on a steerable control bar, the improvement wherein on said platform there is pivotally mounted a saddle plate piece having shaped uprights which form a supporting structure for a double-acting hydraulic jack the piston rod



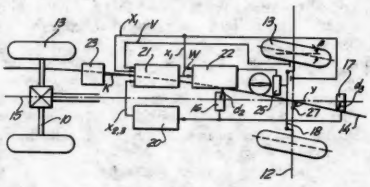
whereof has a yoke having two legs attached thereto, the said two legs of said yoke being adapted to securely engage with the front wheel of a helicopter to be towed so as to drag said wheel along on said saddle plate piece to be pivotally supported thereby about a substantially vertical axis.

4,576,246

METHOD AND DEVICE FOR AUTOMATICALLY STEERING A VEHICLE

Michael Stieber, Weston, Canada; Peter Meinke, Steinebach, and Gunther Dreher, Munich, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 320,785, Nov. 12, 1981, abandoned.
This application Dec. 28, 1984, Ser. No. 687,193
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042723
Int. Cl.[4] G05D 1/00
U.S. Cl. 180—168 7 Claims



1. A method for automatically steering a trackless vehicle along a routing or guide line, comprising the steps of:

sensing the distance between a reference point on the vehicle and the guide line, and producing a position signal representative thereof, the position signal being affected by interference encountered by the vehicle, such as disturbances caused by winds and rough roads,

producing a datum signal corresponding to the position signal which would be produced if the vehicle traveled in an undisturbed manner along the guide line,

producing a curvature-sensitive steering signal component which varies only with the shape of the guide line,

using the position signal and datum signal to produce an interference-sensitive steering signal component which varies only with the interference encountered by the vehicle,

combining the curvature-sensitive steering signal component and the interference-sensitive steering signal component to produce a steering signal, and

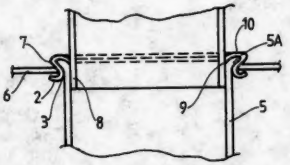
using the steering signal to control the steering of the vehicle

so as to minimize the distance between the reference point on the vehicle and the guide line.

4,576,247
LOCKING MEMBER

Denis Thorpe, Titahi Bay, New Zealand, assignor to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Sep. 22, 1983, Ser. No. 534,831
Int. Cl.⁴ F01N 7/18
U.S. Cl. 181—243 **6 Claims**



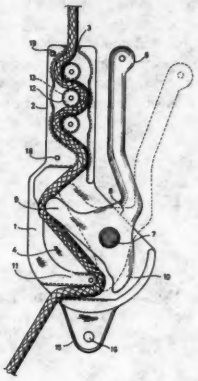
1. A muffler including:
a baffle plate having at least one aperture;
at least one muffler tube extending into the aperture in the baffle plate; and
a locking collar formed separately from both the baffle plate and the muffler tube, and connecting the muffler tube to the baffle plate, the locking collar including
a side wall of a substantially circular cross section located between the plate and the tube,
a first flange extending inwardly from a first end of the side wall, deformed over a first end of the tube, and capturing the first end of the tube between the side wall and the first flange thereby to mechanically join the tube to the locking collar, and
a second flange spaced from the first flange, extending outward from a second end of the side wall, seating against the plate, and capturing the plate between the second flange and the side wall thereby to mechanically join the plate to the locking collar.

4,576,248
RESCUE AND GLIDER DEVICE

Dan Marom, Tamar Street 32/1, Neve Monosson, Israel

Filed Apr. 19, 1985, Ser. No. 725,008
Claims priority, application Israel, May 2, 1984, 71719
Int. Cl.⁴ A62B 1/14
U.S. Cl. 182—5 **6 Claims**

1. A rescue and glider device for the purpose aforesaid comprising a shallow housing, a cable, an inlet opening for the cable and an outlet opening for the cable, a substantially T-shaped lever, the leg of the T-shape extending to the outside being pivotally mounted within the housing at the juncture of the leg and webs of the T-shape, one part of the web of the lever which is at one side of the leg extending toward said inlet opening and being longer than the distance from said pivot to the corresponding side wall of the housing, the other part of the web at the opposite side of the leg extending towards the outlet opening, guide means being provided to guide the cable from the inlet towards the web of said lever, the automatic rotation of said lever into a cable locking position being caused

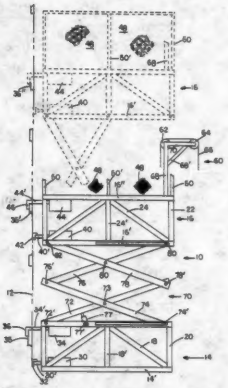


and accomplished by a load on said cable, while the release thereof is effected by the manual rotation of said lever.

4,576,249
DEVICE FOR FIGHTING FIRES IN HIGHRISE BUILDINGS AND TOWERS

John P. Zima, 25058 N. Chestnut St., Newhall, Calif. 91321

Filed Sep. 24, 1984, Ser. No. 653,160
Int. Cl.⁴ E04G 3/16, 5/04
U.S. Cl. 182—82 **5 Claims**



1. A device for fighting fires in highrise buildings and towers, comprising:
a first lower platform frame means upon which firefighters may stand for support;
a second upper platform frame means upon which firefighters may stand for support above said first lower platform frame means and interconnected therewith;
means interconnecting said first lower platform frame means and said second upper platform frame means for adjustably varying the distance between said first and second supporting frame means for selective use thereby;
said first and second platform frame means comprising means for releasably and fixedly mounting said platform

frame means to a portion of a building adjacent a particular story of a building on fire such that the upper platform frame means and lower platform frame means may be moved along the side of the building;

each of said means for releasably and fixedly mounting comprising a retractable hook means movable between a first locking position and a second unlocking position, said hook means being attached to a story of a building on fire in said first position; and a first and second extensible and retractable support means mounted to said first and second platform frame means, respectively, for movement between two positions;

said support means being mounted below said hook means on each respective platform frame means.

4,576,250

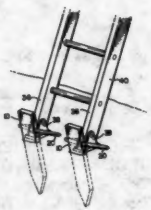
LADDER STOP

Robert Marish, 330 Boro Rd., Primos, Pa. 19018

Filed Jun. 3, 1985, Ser. No. 740,585

Int. Cl.[4] E06C *7/46*

U.S. Cl. 182—108 **5 Claims**



1. A device for effectively preventing ladder slippage for use with ladders that are positioned against structures, for use on non solid surfaces, consisting of a pointed anchoring spike upon which are mounted a pair of parallel arms wherein the said parallel projecting arms are formed from a single bracket welded to the back of said spike and bent downward to an angle ranging from 10° to 45° in reference to said spike.

4,576,251

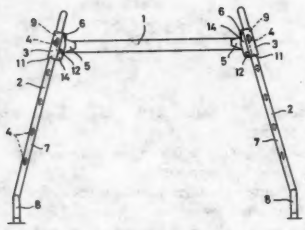
FOLDING SCAFFOLD

Masahiro Matsuura, 19-21, Toyono-cho, and Eiichi Aikawa, 16-10, Ikedahigashimachi, both of Neyagawa-shi, Osaka, Japan

Filed Jul. 15, 1985, Ser. No. 755,143

Int. Cl.[4] E04G *1/34*

U.S. Cl. 182—152 **1 Claim**



1. A scaffold comprising:

a scaffold plate;

a pair of ladders each having a plurality of crossbars and mounted at each end of said scaffold plate;

hook members each secured to each corner of said scaffold plate; and

holder members each pivotally mounted on said respective hook members for holding said ladder;

said hook members each formed with a notch to receive one of the crossbars on said ladder and having a means for holding said holder member to limit the tilting of said holder member toward said scaffold plate.

4,576,252

ROTATION DAMPER

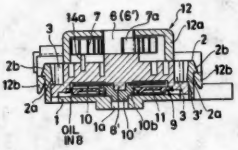
Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Apr. 10, 1984, Ser. No. 598,534

Claims priority, application Japan, Apr. 15, 1983, 58-55429[U]

Int. Cl.[4] F03G *1/00;* F16D *57/00;* E05F *3/14*

U.S. Cl. 185—39 **4 Claims**



1. A rotation damper comprising:

a base member;

a gear wheel rotatably mounted on said base member;

damping means affixed to one side of said gear wheel for braking gear wheel rotation in both directions;

a cap member covering said gear member and said damping means secured to said base member;

spring means within said cap member affixed to the other side of said gear wheel on one end and affixed to said cap member at its other end for providing a restoring force in a direction opposite that of desired rotation of said gear wheel; and

means for locking said gear wheel in a desired position and preventing said restoring force of said spring means from rotating said gear wheel in a direction opposite that of the desired rotation of said gear wheel and being capable of releasing said gear wheel to allow said restoring force to rotate said gear wheel.

4,576,253

VELOCITY CONTROL APPARATUS FOR AN ELEVATOR

Tooru Tanahashi, Gifu, and Isao Tadenuma, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,303

Claims priority, application Japan, Jul. 18, 1983, 58-130711

Int. Cl.[3] B66B *1/44*

U.S. Cl. 187—29 R **11 Claims**

1. A velocity control apparatus for an elevator wherein a motor for running a cage is controlled thereby to perform a velocity control; comprising:

(a) a converter which converts alternating current fed from a power source, into direct current;

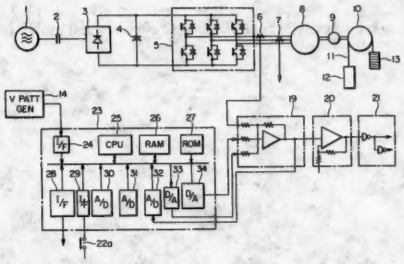
(b) a capacitor which is connected across D.C. output terminals of said converter and which smooths the D.C. output;

(c) an inverter which receives the smoothed D.C. output and which inverts it into alternating current so as to supply the A.C. output to said motor;

(d) a detector which detects the A.C. output of said inverter;

(e) a control device which delivers a signal for controlling

said inverter, while varying it on the basis of the detected output of said detector; and



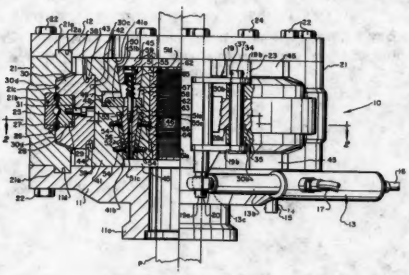
(f) a storage device which detects the output of said detector when said inverter is not generating the A.C. output and which sends it to said control device.

4,576,254

HYDRAULICALLY ACTUATED SLIP ASSEMBLY

Don C. Cox, Roanoke, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 6, 1984, Ser. No. 577,015
Int. Cl.[4] B23Q *5/033*
U.S. Cl. 188—67 **18 Claims**



1. An improved hydraulically actuated double acting slip assembly comprising:

(a) housing means including

a lower plate with a connector thereon and a passage for pipe therethrough,

an upper plate with a passage for pipe therethough, and

ring segments, each having a horizontal groove therein, positioned between said plates and around said pipe passages and connected to said plates;

(b) radial guiding means disposed in said housing means around said pipe passages;

(c) gripping means, slidably mounted in said guiding means for gripping pipe passing through said plate passages, including double acting slip means for gripping gripped pipe tighter, automatically actuated by thrust on gripped pipe sufficient to cause vertical movement of the gripped pipe including,

wedges mounted in said guiding means, each wedge having a female "T" slot across its outer surface and upper and lower downwardly and inwardly inclined surfaces on its inner face and a recess in the upper inclined surface, said recess having a lower planar surface, secondary wedges, mounted on said wedges, each having upper and lower downwardly and inwardly inclined surfaces on its outer face, engaging said wedge inclined surfaces,

means slidably connecting said secondary wedges to said wedge for downward movement, each secondary wedge also having upper and lower downwardly and outwardly inclined surfaces on its inner face and a hole between said secondary wedge upper inclined surfaces on its inner and outer faces, said hole having a lower planar surface,

slip means, mounted on said seconary wedges, including a slip having upper and lower downwardly and outwardly inclined surfaces on its outer face and a recess in said slip upper inclined surface, said recess having a lower planar surface and said slip inclined surfaces engaging said secondary wedge inner face inclined surfaces,

means for slidably connecting said slip means to said secondary wedges for upward movement, a bar having a first hole therethrough, pivotally mounted in each wedge recess, and extending through the secondary wedge hole and into the slip recess, and

biasing means, disposed in each secondary wedge, biasing said bar downwardly and aligning the lower planar surfaces of the wedge recess, the secondary wedge hole and slip recess, to position the secondary wedge and slip means in position for pipe grip tightening actuation;

(d) single cylinder actuating means for moving said gripping means inwardly and outwardly in said guiding means to grip and ungrip pipe; and

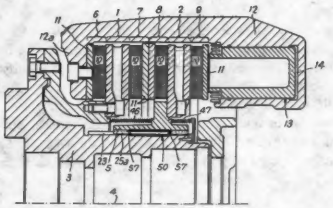
(e) means preventing said actuating means from being actuated to release gripped pipe when thrust on gripped pipe has actuated said slip means.

4,576,255

MULTI-DISC BRAKES

Jean-Claude Méry, Pavillons sous Bois; Jean-Jacques Carré, Le Raincy, and Alain Thioux, Chenevières, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jun. 21, 1984, Ser. No. 622,916
Claims priority, application France, Jun. 30, 1983, 83 10918
Int. Cl.[4] F16D *55/36*
U.S. Cl. 188—71.5 **7 Claims**



1. A multi-disc brake comprising a first rotary disc fixed to a hub which is connected to a component to be braked, a second rotary disc mounted on the hub and slidable in a direction parallel to an axis of the hub, axes of the hub and discs coinciding with one another to form a common axis, and an assembly of friction pads incorporating friction linings for engaging faces of the discs by means of an actuating device, the second disc carried by an internally splined sleeve slidable on an externally splined part of the hub, mutual engagement of the splines insuring that second disc rotates with the hub, characterized in that the brake includes an elastic element disposed between the sleeve and hub to generate a circumferential preload torque about the common axis and engage flanks of the splines of the hub and sleeve so that braking force is transmitted from the discs to the hub, the elastic element disposed and expanded within a housing formed by elimination of at least one spline between a spline of the hub and a spline of the sleeve, the elastic element comprising a block of resilient material having a lateral width approximating a circumferential width of the housing and expanded circumferentially as a result of insertion of a pin into a longitudinal inner opening extending in the block, the elastic element bearing on adjacent splines which define radial sides of the housing and biasing the adjacent

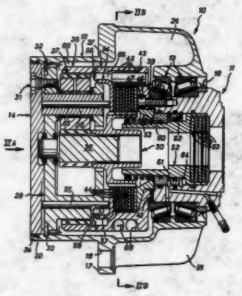
splines circumferentially apart from one another, and the block being formed by two half-blocks coupled symmetrically along a central radial plane of the housing each half-block including half of the longitudinal inner opening receiving the pin.

4,576,256

WHEEL HUB WITH BUILT-IN BRAKE

Léonce Rogier, Saint Denis, France, assignor to SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile, Saint Etienne, France

Filed Nov. 2, 1983, Ser. No. 548,008
Claims priority, application France, Nov. 3, 1982, 82 18401
Int. Cl.[4] B60B *27/00*; F16D *55/40*
U.S. Cl. 188—71.6 **13 Claims**



1. A hub for a wheel, said hub having a built-in brake assembly and comprising a fixed support sleeve, a hollow body which is mounted rotatably on said sleeve and constitutes a casing adapted to contain a hydraulic lubrication and cooling fluid, an annulus disposed within said hollow body so as to leave an annular space between said annulus and said body, said brake assembly being within said annulus and featuring at least one rotary disk which is adapted to be constrained to rotate with an associated wheel shaft, and scooping means associated with said annulus for force feeding the hydraulic fluid radially inwardly from said annular space between said annulus and said hollow body into the interior of said annulus in order to cool and lubricate the brake disk therein.

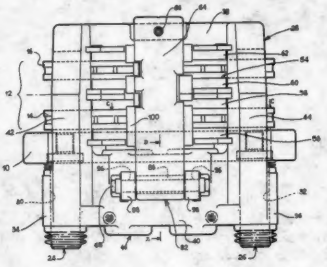
4,576,257

DISC BRAKE WITH REMOVABLE CALIPER REINFORCING ARM

Jean J. Carré, Le Raincy, and Guy Meynier, Aulnay Sous Bois, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jul. 11, 1984, Ser. No. 629,931
Claims priority, application France, Jul. 13, 1983, 83 11664
Int. Cl.[4] F16D *55/00*
U.S. Cl. 188—73.32 **7 Claims**

1. A disc brake, of the type incorporating a caliper astride a rotating assembly to be braked, the caliper being formed by two axially spaced-apart beams positioned axially on each side of the rotating assembly and by two circumferentially spaced-apart arms passing over the periphery of the rotating assembly and joining the two beams to one another, the two spaced-apart arms and the two axially spaced-apart beams defining a radial opening for mounting and removing friction components which cooperate with the rotating assembly to be braked, characterized in that the brake comprises a third caliper arm providing a rigid connection between the axially spaced-apart beams in order to strengthen the caliper, the third caliper arm lying above and extending over the opening and having one end pivotally mounted about a hinge shaft on one of the beams and the other end rigidly joined without play to the other beam, the brake having an eccentric system coaxial with the hinge shaft of the third arm, the hinge shaft formed by a bolt having a cylindrical shaft portion cooperating with a bore formed in the one beam, said cylindrical shaft portion including a longitudinal groove receiving a longitudinal key which fixes firmly in rotation thereto a cylindrical bush having



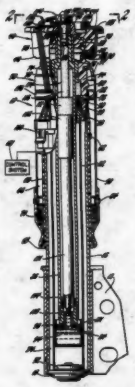
a key-receiving groove in an eccentric bore in which the cylindrical shaft portion is disposed, the bush having an outer cylindrical surface disposed within a bore formed in the third arm so that rotation of the bolt and rotationally fixed bush causes said third arm to be displaced axially and provide said rigid connection.

4,576,258

ADAPTIVE RIDE HYDRAULIC DAMPER

Andrew M. Spisak, Youngstown, and Robert L. Adduci, Girard, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,857
Int. Cl.[4] F16F *9/50*
U.S. Cl. 188—299 **5 Claims**



1. A hydraulic damper for connection between sprung and unsprung portions of a wheeled vehicle and operative to dampen the ride motions of the vehicle comprising: a first tubular member having a hydraulic fluid therein operatively connected to one of said portions of said vehicle, a piston operatively mounted in said first tubular member and having valve means moved to selected positions therein to vary control the flow of fluid therethrough when stroking within said cylinder tube, a hollow piston rod operatively connected to said piston and extending upwardly through the end of said damper for connection with the other of said portions of said vehicle, electrically energizeable actuator means operative mounted within said hollow piston rod for moving said valve

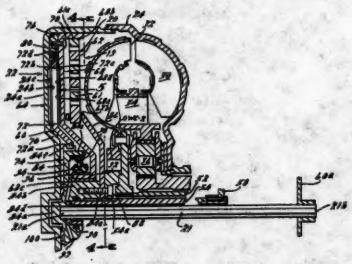
means to said selected positions, control means for electrically energizing and controlling said actuator means, conductor means electrically connecting said controls to said actuator means, said conductor means comprising an insulated bulkhead fixed within said hollow piston rod and electrically connected to said actuator means, and seal means carried by said insulated bulkhead with sealing contact with the inner wall of said hollow piston rod to provide fluid sealing of said piston rod to block the escape of fluid from said damper during operation thereof.

4,576,259

TORSION DAMPING MECHANISM WITH VARIABLE DAMPING

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1984, Ser. No. 615,017
Int. Cl.[4] F16D *3/80, 35/00*
U.S. Cl. 192—3.21 **10 Claims**



1. A torsional damping mechanism adapted for connection between input and output drives of a torque transmitting driveline; first and second members mounted for relative rotation about a common axis for clutching coaction therebetween to damp driveline torsionals; resilient means interconnecting the members in parallel with the clutching coaction for transmitting steady-state driveline torque between the drives and for isolating driveline torsionals; the improvement comprising:

clutching surfaces defined by the members and retained against axial and radial movement relative to each other, said surfaces operative to effect the clutching coaction between the members and shaped to vary the amount of clutching coaction for varying the amount of damping of said driveline torsionals in response to the level of steady-state driveline torque being transmitted by the resilient means.

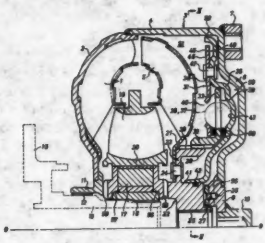
4,576,260

LOCK-UP CLUTCH OF A TORQUE CONVERTER

Masahiko Koshimo, Higashi-Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Oct. 19, 1983, Ser. No. 543,645
Claims priority, application Japan, Oct. 20, 1982, 57-185691
Int. Cl.[4] F16H *45/02;* F16D *3/14, 3/66*
U.S. Cl. 192—3.31 **5 Claims**

1. A lock-up clutch of a torque converter comprising a disc hub adapted to be connected slidably only in an axial direction to a turbine hub of a torque converter and having a radial hub flange, a pair of annular side plates disposed at both sides of the hub flange, a plurality of torsion springs arranged in sets disposed in openings and hollows in the hub flange and the side plates for connecting the side plates to the hub flange, each set of torsion springs being adapted to engage at both ends thereof with the side plates and the hub flange, a friction portion provided on a radially outer portion of one of said annular side plates and adapted to be axially pressed to an inner surface of



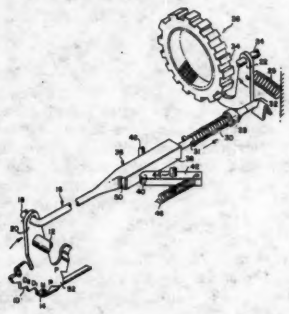
a front cover of the torque converter, and a forcing means for forcing and pressing the friction portion to said front cover.

4,576,261

SAFETY PARKING BRAKE FOR AUTOMATIC TRANSMISSIONS

William A. Barr, Gibson Island, Md. 21056, assignor to William A. Barr Memorial Trust; Barr-Scarlett Trust and Barr-Truitt Trust, all of Gibson Island, Md., by William A. Barr, trustee, part interest to each

Continuation of Ser. No. 585,397, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 485,513, Apr. 15, 1983, abandoned. This application Jun. 4, 1985, Ser. No. 741,203
Int. Cl.[4] B60K *41/26*
U.S. Cl. 192—4 A **11 Claims**



1. In a parking brake for an automatic transmission having a toothed parking gear secured to an output shaft journaled in a stationary housing of a vehicle, a pawl movable in said housing between a park position in which said pawl engages said toothed gear and a non-park position in which it is clear of said gear, driver operated means movable in one direction from reverse towards park position and in the opposite direction from park towards reverse position, a control rod operably connected to said driver operated means, cam means operated in response to movement of said control rod and engageable with said pawl to control its movement towards said parking gear when said driver operated means is moved towards its park position, and to control its movement away from said parking gear when said driver operated means is moved away from its park position, and yieldable resilient means operable on said cam means to enable said driver operated means and said control rod to be moved to their full park positions independently of said cam means when said pawl is prevented by engagement with the surface of a tooth from entering the space between two teeth of said parking gear, the improvement comprising an element operatively connected to said driver operated means for movement therewith, said element having

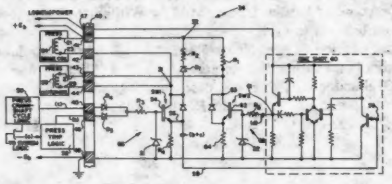
a sliding surface, a member having first and second ends, means pivoting said member at a fixed position remote from one end of said member, and second resilient means urging said one end of said member into sliding engagement with said sliding surface, said surface having a first part which is uniform and continuous so that when said element is moved in response to movement of said driver operated means to every position except between park and reverse positions said surface slides relative to said member without effecting movement thereof, said surface having a second part which is engaged by said member when said element is moved in response to movement of said driver operated means to a position between park and reverse to restrain through said element movement of said driver operated means towards its reverse position when said driver operated means has been accidently positioned between its reverse and park positions.

4,576,262

METHOD AND APPARATUS FOR OPERATING A MAGNETIC CLUTCH

William L. Mohan, and Samuel P. Willits, both of Barrington, Ill., assignors to Spartanics Ltd., Rolling Meadows, Ill.

Filed Dec. 27, 1983, Ser. No. 565,990
Int. Cl.[4] F16D *67/06*
U.S. Cl. 192—18 B **12 Claims**



1. A method for operating a magnetic clutch and brake system of the type which includes a magnetic clutch having a clutch magnetizing coil which can be actuated to couple a first rotatable element to a second rotatable element when voltage is applied across the clutch magnetizing coil and which disengages the second rotatable member when voltage is disconnected from, or connected momentarily in the reverse polarity across, the clutch magnetizing coil, and a magnetic brake associated with the second rotatable element and having a brake magnetizing coil which is in a non-braking mode of operation when energized and which is in a braking mode of operation when de-energized, said method including the steps of:

providing a DC voltage source;

applying a voltage from said voltage source across the brake magnetizing coil for a first time period;

applying a voltage from said voltage source across the clutch magnetizing coil for the first time period with both of said coils being connected in parallel across said voltage source;

providing a unidirectional current path across said coils;

simultaneously and momentarily disconnecting the voltage source across both coils without causing an open circuit of either coil and thereby causing the coils to reverse polarity with the current generated in each coil flowing through said undirectional current path;

reconnecting the voltage source across said clutch magnetizing coil and in series with the brake magnetizing coil but with said clutch magnetizing coil connected in reverse polarity to the first connection thereof across said voltage source and said voltage source connected across said brake magnetizing coil in the same polarity as it was when voltage was first applied across said brake magnetizing coil for a second time period thereby to accelerate a rapid change of magnetic polarity of the clutch magnetizing coil to repel a flywheel coupling disc of the magnetic clutch while maintaining the brake magnetizing coil energized; and

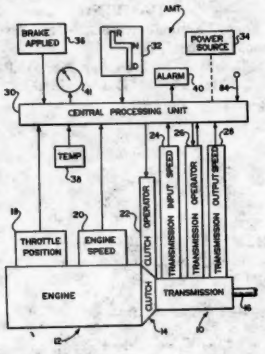
after the second time period, again disconnecting the coils from said voltage source to allow said brake to be actuated to stop movement of said second element.

4,576,263

CLUTCH CONTROL

E. James Lane, Highland; Russell C. Holmes, Troy, and Ronald K. Markyvech, Canton, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 23, 1984, Ser. No. 592,505
Int. Cl.[4] B60K *41/08, 41/02*
U.S. Cl. 192—0.044 **40 Claims**



1. An automatic control system for automatically operating a vehicle master clutch interconnected between a throttle controlled engine and a change gear transmission, said control system including means for receiving sensed or calculated input signals indicative of clutch, engine and transmission operating conditions and means for providing output signals to command the operation of said clutch to a first fully engaged condition, a second fully disengaged condition and a third partially engaged condition, said control system including means for simulating the current operating temperature of the clutch operating surfaces including means for increasing the simulated temperature at a first rate in response to predetermined sensed excessive clutch slippage conditions and means for decreasing the simulated temperature at a second rate in response to the absence of said predeterined excessive sensed clutch slippage conditions.

4,576,264

SERVO CLUTCH MECHANISM, AND THE DRIVE GEAR INCORPORATING SAME

Giorgio Lupo, Rivalta; Pier C. Capra, and Aldo Marcarino, both of Turin, all of Italy, assignors to S.O.M., S.p.A., Reggio Emilia, Italy

Filed Dec. 1, 1983, Ser. No. 556,852
Int. Cl.[4] F16D *21/06, 13/42*
U.S. Cl. 192—48.91 **8 Claims**

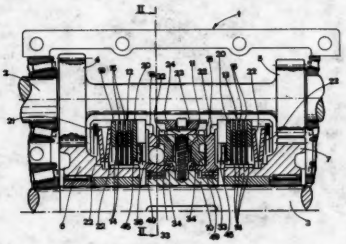
1. A servo-assisted clutch mechanism comprising an input shaft, an output shaft, a primary wheel or gear driven by said input shaft, a secondary gear turning with said output shaft as one, a clutch mechanism whose engaging component may shift axially against the agency of sprung means so as to engage said primary and secondary gears, a clutch control collar turning as one with said secondary gear, shifting axially with respect thereto, and assuming both a non-working and a working position, the latter being that in which its action on said clutch engaging-component is brought to bear,

an intermediate wheel fitted to said secondary gear and

capable of turning through a limited angle with respect thereto against the agency of sprung means so as to reach a limit beyond which said secondary gear will be driven by said intermediate wheel;

a number of thrust elements located in axial holes at said intermediate wheel and sliding therein whilst having one end in contact with a frontal cam offered by said ring and the remaining end directed toward said clutch-mechanism's engaging-component;

said clutch-mechanism being designed to engage said primary gear with said intermediate wheel into working position, thus causing said intermediate wheel following shift of said control collar into working position, thus



causing said intermediate wheel to turn through a limited angle with respect to said secondary gear; said frontal cam being of shape such that in bringing about turn through a limited angle of intermediate wheel as aforesaid, said thrust elements will each travel an incline disposed in such a way as to urge same in an axial direction against the clutch-mechanism's said engaging component; the improvement comprising—

a ring mounted free-wheel in fixed axial position on said secondary gear and having the frontal cam profile; and means for causing said ring to rotate as one with said secondary gear when said control collar is in said working position.

4,576,265

CONTROL SYSTEM FOR HYDRAULIC AUTOMATIC CLUTCH

Haruyoshi Kumura; Yoshikazu Tanaka, both of Yokohama; Keiju Abo; Hiroyuki Hirano, both of Yokosuka, and Sigeaki Yamamuro, Zushi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1983, Ser. No. 543,838

Claims priority, application Japan, Oct. 22, 1982, 57-184627; Mar. 14, 1983, 58-40808; Apr. 22, 1983, 58-70095; May 27, 1983, 58-92418

Int. Cl.[4] B60K *41/28*

U.S. Cl. 192—0.055 **13 Claims**

1. A control system for a hydraulic automatic clutch of a vehicle having an engine, comprising:

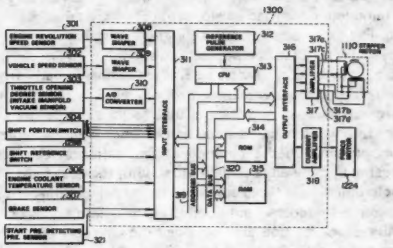
a hydraulic clutch;

an engine revolution means for generating an engine revolution fluid pressure signal indicative of a revolution speed of the engine;

a start adjustment valve means for generating a start adjustment fluid pressure signal in response to an electric signal;

a starting valve means coupled with said engine revolution means and said start adjustment valve means for generating a start fluid pressure in response to said engine revolution fluid pressure signal and said start adjustment fluid pressure signal, said start fluid pressure being supplied to said clutch to engage same; and

an electronic control unit means for controlling said electric signal to keep said clutch in a predetermined state regardless of a variation in said engine revolution fluid pressure



signal when the engine idles with the vehicle at a standstill.

4,576,266

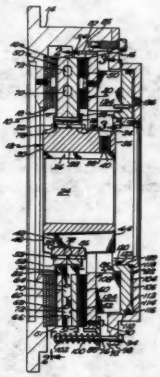
ROTATIONAL CONTROL APPARATUS

Hugh K. Schilling, St. Paul; Leonid Dayen, Blaine, and Charles D. Raines, Plymouth, all of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Jul. 12, 1984, Ser. No. 630,364

Int. Cl.[4] F16D *13/72, 65/827*

U.S. Cl. 192—70.12 **24 Claims**



1. Drive disc comprising, in combination: a ventilated hub comprising, in combination: a generally cylindrical portion having a first end and a second end; axially extending air cooling bores extending through the cylindrical portion; axially extending fins extending from the second end of the cylindrical portion and located between and out of circumferential alignment with the axially extending air cooling bores, with the axially extending fins of the hub having a decreasing radial size and a decreasing axial thickness in a direction extending away from the cylindrical portion, with the axially extending air cooling bores having a decreasing radial size over its axial length from the second end of the cylindrical portion to the first end of the cylindrical portion; and axially extending shoulders extending from the second end of the cylindrical portion, with the axially extending bores and the axially extending fins being located between and out of circumferential alignment with the axially extending shoulders, and radially extending threaded bores formed in the axially extending shoulders for receiving set screws for abutting with a shaft to be connected to the hub; and animproved ventilated friction disc intercon-

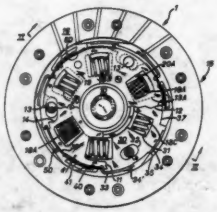
nected to the hub, with the friction disc comprising, in combination: a first individual component disc, a second, individual component disc, means for interconnecting the first and second component discs together to form the friction disc, heat radiating fins extending generally longitudinally between the internal surfaces of the component disc and internally of the friction disc, with the heat radiating fins extending radially from the hub in a circumferentially spaced relation throughout the circumference of the friction disc to thus divide the friction disc into wedge shaped areas, at least one cooling air entry port formed through the component disc adjacent the hub and located in the wedge shaped areas, with the heat radiating fins including at least three columns in a spaced relation forming fin openings therebetween to define an air cooling chamber internally of the friction disc, between the air entry port, through the fin openings of the heat radiating fins, and out of the periphery of the friction disc to allow passage of cooling air radially and also circumferentially inside the friction disc to allow increased heat transfer, cooling, and apparatus efficiency, with the fin openings being in circumferential alignment to form an obstruction free annular air path around the entire circumference of the friction disc.

4,576,267

CENTRIFUGAL ACTUATOR DEVICE, IN PARTICULAR FOR A CLUTCH DISK ASSEMBLY

Pierre Loizeau, Ville D'Avray, France, assignor to Valeo, Paris, France

PCT No. PCT/FR83/00187, § 371 Date May 18, 1984, § 102(e) Date May 18, 1984
PCT Filed Sep. 20, 1983, Ser. No. 616,221
Claims priority, application France, Sep. 21, 1982, 82 15866
Int. Cl.[4] F16D *3/66*
U.S. Cl. 192—70.17 20 Claims



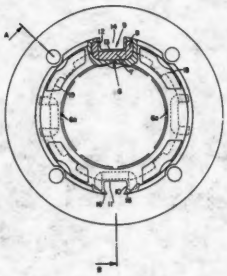
1. A centrifugal actuator device comprising two rotary members mounted for relative angular movement, a circumferential support track provided on one of said rotary members, a radial lug extending radially from said one member relative to said track, a cantilevered retaining tab extended from said lug, an actuator member of generally arcuate shape adapted to overlie a portion of said circumferential track, said actuator member being substantially rigid and having a slot by which said actuator member is engaged around said lug with radial and circumferential play, and said actuator member being received partially under said retaining tab so that said actuator member can tilt around said lug in response to centrifugal force, and a spring radially interposed between said retaining tab and said actuator member for elastically normally biasing said actuator member into contact with said track.

4,576,268

SLIDING SLEEVE FOR CLUTCH SHIFTERS

Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Roland Haas, Lendershausen, and Herbert Dobhan, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,399
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 8137226[U]
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 3 Claims



1. A sliding sleeve for a clutch shifter particularly for automotive clutches comprising an elongated generally tubular hub body made of a plastic material, an annular metallic thrust collar projecting radially outwardly from the hub body and connected thereto by connecting means, said connecting means including at least two lugs projecting axially from one radial face of said thrust collar, each lug being of generally U-shaped cross section consisting of a base section and generally radially directed upstanding leg portions, said leg portions spaced axially from said radial face of the thrust collar to provide a web of plastic material therebetween, said lug defining a groove for the shift lever extending in an axial direction, a thin plastic layer overlying the base and upstanding leg portions of each of said lugs and said radial face of the thrust collar at the inner axial end of the groove being uncoated and presenting a direct metallic contact surface for the shift lever.

4,576,269

AUTOMATIC MULTISPEED TRANSMISSION FOR VEHICLES WITH MANUAL MEANS FOR PROHIBITION OF ENGAGEMENT OF A CENTRIFUGAL CLUTCH

Masumi Hamane, Kawagoe, and Kaoru Hanawa, Asaka, both of Japan, assignors to Honda Giken Kogyo K.K., Japan

Filed Jan. 12, 1983, Ser. No. 457,355
Claims priority, application Japan, Jan. 13, 1982, 57-3777; Jan. 13, 1982, 57-3778
Int. Cl.[4] F16D *23/10*
U.S. Cl. 192—103 A 12 Claims

1. An automatic multispeed transmission for combination with a vehicle equipped with an engine having a throttle value adjusting means for manually controlling the quantity of intake air being supplied to the engine, said quantity corresponding to the opening of a throttle valve of said engine, and an output shaft, comprising:

at least two centrifugal clutches each arranged on a corresponding rotary shaft arranged to be rotatively driven by said output shaft of said engine, said centrifugal clutches being adapted to engage at predetermined different rotational speeds of said output shaft of said engine, each of said centrifugal clutches including:

an input member arranged to be rotatively driven by the

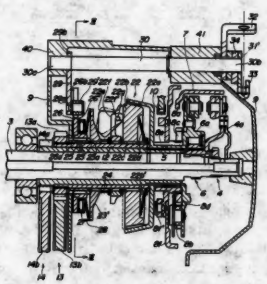
rotary shaft upon which the corresponding centrifugal clutch is arranged,

an output member disposed for engagement with said input member, and

weight means disposed for centrifugal opening action in response to rotation of said rotary shaft for causing engagement of said input member with said output member at one of said predetermined different rotational speeds of said output shaft of said engine;

at least two reduction gear means each drivingly coupled with one of the output members and the input member of a corresponding one of said centrifugal clutches for carrying out speed reduction of the rotational speed of said engine with predetermine different reduction ratios, dependent upon engagement and disengagement of said respective centrifugal clutches;

prohibiting means for prohibiting the centrifugal opening action of said weight means of one of said centrifugal



clutches which is adapted to engage at one of said predetermined rotational speeds of said output shaft of said engine, higher than the lowest one thereof;

wherein when said one of said centrifugal clutches is engaged, one of said reduction gear means operates, which has a reduction ratio smaller than that of another one of said reduction gear means which operates when another one of said centrifugal clutches engages at the lowest one of said predetermined rotational speeds of said output shaft; and

manually operatable control means for driving said prohibiting means,

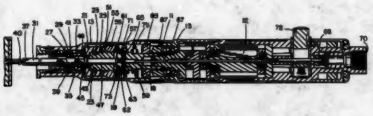
said manually operatable control means being operatively connected with said throttle valve adjusting means in such a manner that said control means operates to drive said prohibiting means when said throttle valve adjusting means assumes a position corresponding to an intake air quantity greater than a predetermined value.

4,576,270

TORQUE CONTROL AND FLUID SHUTOFF MECHANISM FOR A FLUID OPERATED TOOL

James P. Baltz, and Richard E. Plouck, both of Bryan, Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed Feb. 28, 1983, Ser. No. 470,509
Int. Cl.⁴ B25B *23/145*
U.S. Cl. 192—150 **13 Claims**



1. In a fluid power tool of the type including a fluid driven motor with a rotary output shaft, a fluid inlet to the motor, an inlet control mechanism to control fluid flow to the motor, and a clutch mechanism, connecting the output shaft with a tool bit, the improvement comprising, in combination:

a fluid shutoff mechanism associated with the clutch mechanism, said fluid shutoff mechanism including a throughbore axially extending through the shaft; a throttle rod in the throughbore translatable in one axial direction to terminate fluid flow through the fluid inlet to the motor and in the opposite axial direction to allow fluid flow to the motor;

a passage in the shaft transverse to the throughbore intermediate the ends of the throughbore and adjacent an end of the throttle rod positioned in the throughbore;

at least one radially displaceable member positioned in the transverse passage for engagement with the throttle rod;

a slidable kickout sleeve on the shaft for retaining the radially displaceable member positioned in the passage for engaging the throttle rod;

means biasing the slidable kickout sleeve to the position for retaining the radially displaceable member to engage the throttle rod;

a thrust pin coaxial with the throttle rod and in the throughbore on the opposite side of the transverse passage from the throttle rod, said thrust pin engageable with the tool bit and translatable against the radially displaceable member to drive the throttle rod to open fluid flow through the fluid inlet; and

a torque responsive sleeve release mechanism on the shaft slidable axially to release the slidable kickout sleeve from retaining the radially displaceable member, said radially displaceable member movable in the passage to permit axial translation of the throttle rod to terminate fluid flow to the fluid inlet, said sleeve release mechanism including a tool bit holder mounted on the shaft and rotatable with respect thereto, and a cam sleeve slidably mounted on the shaft for axial movement, said cam sleeve biased for engagement with a cam surface on the tool bit holder whereby during normal operation of the tool, the tool bit holder remains fixed relative to the cam sleeve, said tool bit holder rotating relative to said cam sleeve to axially drive the cam sleeve when a threshold torque acts on the tool bit holder.

4,576,271

COIN OPERATED PULL-DOWN DOOR AND DOOR SPRING MECHANISM FOR VENDING MACHINE

Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Filed Aug. 5, 1983, Ser. No. 520,718
Int. Cl.⁴ G07F *5/08*
U.S. Cl. 194—233 **24 Claims**

1. A pull down door assembly and coin mechanism for a vending machine comprising:

a frame;

a pull down door having a lower edge hingedly mounted to said frame for movement between a closed and an open position;

latch means including a camming surface affixed to an upper portion of said door for normally releasably locking said door against opening;

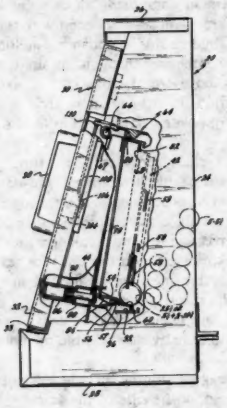
coin seat means;

a coin receiving and sorting mechanism disposed intermediate said latch means and said coin seat means for wedging proper coinage against said coin seat means;

a rod mounted for normally yielding to said camming surface when an attempt is made to open said door; and

means cooperating with coinage and wedged against said coin seat means so as to urge said rod into camming en-

gagement with said camming surface in response to opening movement of said door thereby biasing said latch



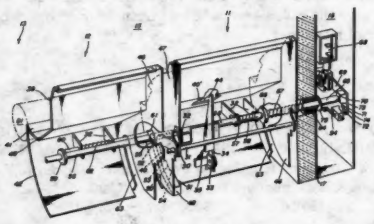
means out of locking engagement to allow opening of said door.

4,576,272

COUNTER-TOP OR WALL-MOUNTED VENDING MACHINE

Annis R. Morgan, Jr., Atlanta, Ga.; Bernd Mehlan, Herrieden; Josef Gress, Bechhofen, both of Fed. Rep. of Germany, and Hugh S. Williford, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jun. 21, 1984, Ser. No. 623,027
Int. Cl.[4] G07F *5/16*
U.S. Cl. 194—215 **19 Claims**



1. An automatic vending machine comprising:

a cabinet having a front wall with at least two openings therein through which products may be vended;

at least two product storage chutes disposed within said cabinet in a side-by-side, parallel relationship behind said openings;

a cradle disposed in each of said openings forming a row of adjacent cradles for receiving products from said at least two chutes when in a closed position with respect to the associated opening and vending said products in fully open positions;

indexing means for moving and stopping said cradle at a partially-open position intermediate to said closed and fully open position, said partially-open position permitting products to be viewed but not removed by a customer from said cradle; and

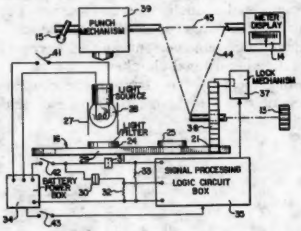
mechanical interlock means responsive to the opening of any of said cradles for blocking the opening of any other cradle.

4,576,273

OPTICAL CARD AND CARD READER SYSTEM FOR PURCHASE OF PARKING TIME

Arthur G. Milnes, 1417 Inverness Ave., Pittsburgh, Pa. 15217

Filed Jun. 11, 1984, Ser. No. 619,609
Int. Cl.[4] G07F *1/06*
U.S. Cl. 194—209 **9 Claims**



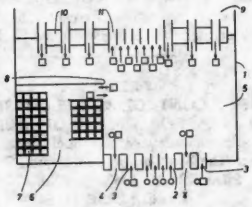
1. An automatic system for dispensing services controlled by cards carrying successively positioned individual light filters comprising a card reader including a light source, light sensing means positioned to receive light from said light source, means successively positioning said card in said reader to station each said individual light filter between said light source and said light sensing means, means actuated by the output of said light sensing means for triggering said dispensing means to dispense a predetermined quantum of services in response to the light transmitted by said individual light filter, and disabling means triggered by the output of said light sensing means for altering the light-transmitting characteristics of said light filter after the predetermined quantum of services has been dispensed, to prevent reuse of said filter in said card reader.

4,576,274

MEANS FOR THE STORING OF CARTS SUCH AS SHOPPING CARTS

Kjeld Thorsen, Floda, Sweden, assignor to Cart-O-Matic Aktiebolag, Stenungsund, Sweden

Filed May 26, 1983, Ser. No. 498,589
Int. Cl.[4] G07F *7/00*
U.S. Cl. 194—210 **5 Claims**



1. A system for the disposition of shopping carts including an entrance area and at least one storage area for such carts which are intended to be removed from and returned to the storage area by users of the carts, comprising, for each storage area, at least one outlet gate and first control means to permit a cart to pass through said outlet gate only if a deposit is registered by said first control means, at least one inlet passage provided with an inlet gate and second control means to permit a cart to pass through said inlet gate only if said cart is identified as an

authorized cart, said second control means being provided with sensing means responsive to actuating means carried by said cart to identify an authorized cart and to permit passage of said cart through said gate only when said sensing means so identifies an authorized cart and to refund at least part of the deposit, said storage area being open for free positioning of said carts in and out of said storage area, and at least one passage for permitting persons without carts free access to and from said entrance area, each gate comprising a housing forming on each side thereof a passage, each passage being provided with stopping means displaceable between an open position for free access of a cart and a closed position to prevent passage of a cart, means for the receiving of a deposit at said outlet gate, means for refunding a deposit at said inlet gate, active sensing means on a wall of said inlet passage formed by said housing to identify a cart presented in said passage, said cart being provided with a passive sensing means to actuate said active sensing means, and actuating means to control the stopping means in said outlet passage to an open position when a deposit is inserted in said deposit receiving means and to position said stopping means in said inlet passage to an open position when said sensing means has identified an authorized cart and to refund a deposit made when said cart was passed through an outlet gate.

4,576,275

COIN DISCRIMINATION APPARATUS

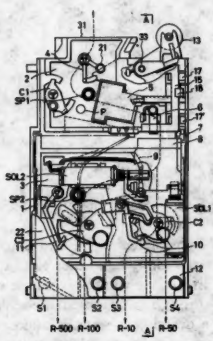
Osamu Kobayashi; Masanori Tanaka, and Jun Ishii, all of Saitama, Japan, assignors to Kabushiki Kaisha Nipponcoinco, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,845

Claims priority, application Japan, Aug. 25, 1983, 58-130362[U]; Aug. 30, 1983, 58-133048[U]; Aug. 30, 1983, 58-133049[U]

Int. Cl.⁴ G07F *3/02*

U.S. Cl. 194—203 **7 Claims**



1. A coin discrimination apparatus for discriminating coins by denomination and for guiding coins of respective denominations to respective denomination coin paths by means of an electronic discrimination unit which is formed by two plates provided in a coin path, a coin selection member which is actuated in response to signals from said electronic discrimination unit and cradles, said coin discrimination apparatus being characterized by:

said electronic discrimination unit provided at an upstream side of said coin path;

a first coin selection member, which is actuated in response to signals from said electronic discrimination unit, provided for selecting authentic and counterfeit coins;

at least one second coin selection member provided at a downstream side of said first coin selection member, said second coin selection member being actuated in response to signals from said electronic discrimination unit for separating authentic coins into two denomination coin paths depending upon the differences in diameter of coins; and

cradles provided at a downstream side of said second coin selection member, said cradles for separating by denomination said coins of each one of the two coin paths which are separated by said second coin selection member.

4,576,276

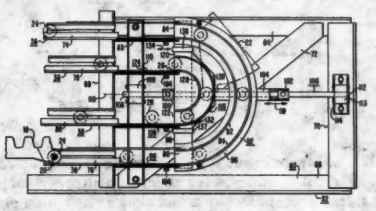
ESCALATOR

Henry Boltrek, Freeport, N.Y., and Peter J. Coakley, Jr, Hackettstown, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1984, Ser. No. 618,842

Int. Cl.⁴ B65G *23/12*

U.S. Cl. 198—332 **5 Claims**



1. An escalator, comprising:

a conveyor having first and second spaced loops constructed of pivotally interconnected, rigid, toothed links,

step axles interconnecting said first and second loops,

axle rollers on said step axles,

steps connected to said step axles,

step rollers on said steps,

a guide arrangement for guiding said conveyor in an endless loop including a truss having axle roller guides and step roller guides,

drive means mounted in said truss, said drive means engaging toothed links of said conveyor,

said truss having movable, free floating, self-adjusting, upper and lower turnaround guide portions mounted for rectilinear movement, and a fixed intermediate guide portion,

and non-binding sliding joints in the axle and step roller guides, between the fixed and movable guide portions of said truss,

said self-adjusting upper and lower turnaround guide portions each including first mounting means and axle roller guide tracks,

said axle roller guide tracks being fixed to said first mounting means,

said first mounting means being rectilinearly adjusted by said axle rollers in response to positioning forces in said conveyor,

said self-adjusting upper and lower turnaround guide portions further including second mounting means and step roller guide tracks,

said second mounting means being fixed to said first mounting means such that rectilinear movement of said first mounting means also adjusts the position of said second mounting means,

said step roller guide tracks being mounted for rectilinear movement relative to said second mounting means, such that positioning forces in the step rollers and associated steps independently position said step roller guide tracks relative to said axle roller guide tracks,

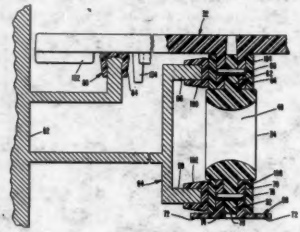
whereby the step and axle roller guide portions of the upper and lower turnaround guide portions are each free to move independently to positions of least resistance in response to instantaneous forces in the conveyor and steps.

4,576,277

CONVEYOR SYSTEM WITH REMOVABLE WEAR MEMBERS

David B. Park, R.D. #2, Box 2730, Spring Grove, Pa. 17362; James R. Snyder, York, Pa.; Gerard J. McDonald, York, Pa., and Roland Hoet, York, Pa., assignors to David B. Park, Middleboro, Mass.

Filed Oct. 11, 1983, Ser. No. 541,008
Int. Cl.[4] B65G *47/84*
U.S. Cl. 198—803.01 5 Claims



1. In a conveyor of the type comprising a chain including a plurality of links connected together for relative pivotal movement at least some of said links including an upwardly projecting first coupling element, a plurality of carriers mounted on at least some of said links, said carriers each including integral downwardly projecting second coupling elements, one of said first and second coupling elements comprising a socket and the other of said first and second coupling elements comprising a post received in said socket, and a dowel pin frictionally disposed in aligned holes in each socket and post assembly, the improvement comprising:

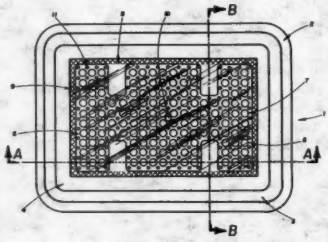
a U-shaped wear sleeve mounted on each said socket and comprising a pair of legs interconnected by a bight, said wear sleeve being releasably mounted on its associated socket by a snap-on fit such that said legs are situated on opposite sides of said socket and overlie said holes in said socket to retain the associated pin.

4,576,278

PURGE TRAP TRAY

Stanislaus Laiewski, Reading; Thomas A. Hessen, Ephrata; Thomas R. Hardy, Lebanon, and Allie F. Gilvin, Sinking Spring, all of Pa., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 443,993, Nov. 23, 1982, abandoned.
This application Sep. 13, 1984, Ser. No. 650,560
Int. Cl.[4] B65D *81/26*
U.S. Cl. 206—204 5 Claims



1. A purge trap tray adapted to display a product which exudes a purge, said tray comprising:

(I.) a sunken reservoir area adapted to contain the liquid purge;

(II.) a support portion adapted to support said product, said support portion comprising:

(A) a shoulder area raised from and completely surrounding said sunken reservoir area;

(B) standoff means rising from said sunken reservoir area;

(C) a product supporting, perforated, liquid impermeable thermoplastic film supported by said standoff means, said film comprising:

(i) a border area adhered to said shoulder in a liquid tight manner;

(ii) a plurality of perforations having diameters adapted to allow capillary flow of purge into said reservoir; and,

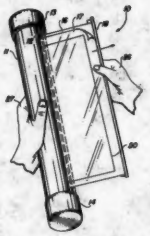
(iii) a centrally located perforation having a diameter adapted to allow free flow of the purge into said reservoir, said centrally located perforation having a greater diameter than that of any other perforation whereby flow of purge into the reservoir is increased and reverse flow of purge upon tilting of the tray is minimized.

4,576,279

DRAWING SUPPORT AND STORAGE APPARATUS

Fred F. Ferderber, 4863 Redwillow Ave., Orlando, Fla. 32808

Filed Nov. 26, 1984, Ser. No. 674,780
Int. Cl.[4] A45C *11/24*; B65D *85/67*
U.S. Cl. 206—225 2 Claims



1. A drawing support and storage apparatus comprising in combination:

an elongated outer casing having an elongated opening therein;

a pair of end caps, at least one end cap being removably mounted to said elongated outer casing;

a flexible planar surface rotably mounted in said casing and protruding through said elongated opening for removably supporting a drawing thereon is said casing, said flexible planar surface having one edge attached to an elongated shaft in said elongated outer casing;

said elongated shaft comprising a center-shaft connected between said end caps in said elongated outer casing, said center shaft including a hollow center tube having a slot therein for attaching the end of said flexible planar surface thereinto and said center shaft having one smooth end for rotably attachng to one said end cap and the other end of said center shaft being threadably connected to a threaded hub on the other said end cap;

a flexible, transparent cover attached to said center shaft over said flexible planar surface for supporting a drawing, or the like, between said flexible planar surface and said flexible transparent cover; and

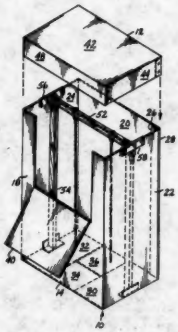
grip means attached to said flexible planar surface exterior of said casing for gripping and removing a portion of said planar surface and flexible, transparent cover from said casing, said grip means having an elongated handle having a generally T-shaped cross section.

4,576,280

HANGING GARMENT CONTAINER

Doublas J. A. Dove, Snohomish County, and Raymond F. Nelson, King County, both of Wash., assignors to Anna Lena Dove, Edmonds, Wash.

Filed Apr. 5, 1984, Ser. No. 597,223
Int. Cl.[4] B65D 85/18; A47F 7/19
U.S. Cl. 206—289 51 Claims



1. A hanging garment container comprising:

(a) a panel structure forming a front wall, a rear wall and a pair of opposite side walls connecting the front and rear walls and having a connected planar bottom structure for the container to create an open top container;

(b) a hanging garment support structure including a horizontal support member extendable across the top of the open top container between opposite side walls;

(c) a pair of vertical support members each for supporting an opposite end of the horizontal member and each supportable on the bottom of the open top container at their lower ends; and

(d) means for securing the ends of the horizontal member to the side walls to prevent relative movement and for securing the tops of the vertical members to prevent relative movement wherein the securement means comprises a pair of brackets, one at each end of the horizontal support member, each bracket connected to one of the vertical support members, and each bracket simultaneously securing the horizontal support member to the associated side wall and securing the top of the associated vertical support members against movement relative to the horizontal member.

4,576,281

DISPOSABLE SYRINGE NEEDLE SEPARATION AND STORAGE BOX

Patricia E. Kirksey, Harlem, Ga., assignor to University Hospital, Augusta, Ga.

Filed Aug. 29, 1984, Ser. No. 645,208
Int. Cl.[4] A61M 5/32; B65F 7/00; B26F 3/00
U.S. Cl. 206—370 4 Claims

1. A disposable syringe needle separation and storage box comprising a vertically upright outer enclosure, said outer enclosure including an externally lockable door for providing access to the interior thereof, an upwardly open syringe needle storage and disposal container positioned therein through said lockable door when open, said enclosure including a hole within the top thereof aligned with the open end of the upwardly open container, the improvement comprising:

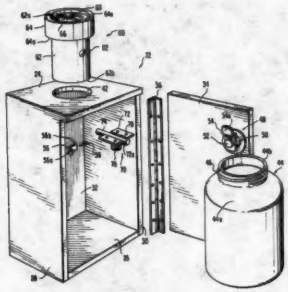
a tubular drop chute, removably axially positioned within said hole within the top of said enclosure,

means internally of said storage box for locking said tubular drop chute to said enclosure in alignment with said container opening,

a needle extractor fixedly mounted to the interior of said tubular chute, said needle extractor comprising a slotted plate at least partially closing off the interior of said drop chute, said plate including a tapered slot having a portion sized in excess to the diameter of the needle to permit manual penetration of the needle into said drop chute, below said extractor plate, permitting lateral movement of the sytinge to a position where the upper end of the needle contacts the bottom of said slotted plate,

whereby, the syringe barrel may be separated from the needle through single hand manipulation, movement laterally within the tapered slot, and by single handed pull of the syringe upwardly to separate the needle, such that the needle falls by gravity into the interior of said container;

whereby, when said syringe needle separation and storage box is in use, said tubular drop chute cannot be removed, since it is latched from the inside, and its removal from said needle separation and storage box and the removal of the disposal container bearing sharps can be accomplished only by unlocking the door, and unlocking of said drop chute from the storage box, thereby insuring the safety of the system.

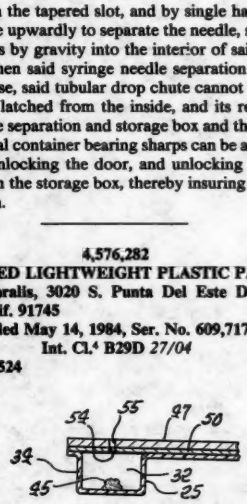


4,576,282

REINFORCED LIGHTWEIGHT PLASTIC PACKAGES

Imants P. Kapralis, 3020 S. Punta Del Este Dr., Hacienda Heights, Calif. 91745

Filed May 14, 1984, Ser. No. 609,717
Int. Cl.[4] B29D 27/04
U.S. Cl. 206—524 15 Claims



1. In a thin walled, light-weight, relatively flexible, molded plastic package having first and second re-entrant recesses respectively at opposite sides of the package, the package stiffened against crushing, comprising

(a) said first re-entrant recess at one side of the package containing sufficient of a predetermined quanity of an expanded synthetic resin as to substantially fill said recess,

(b) said expanded resin cured to form a hardened re-inforcing core in said first re-entrant recess and integrally with the package to stiffen same against crushing, whereby an article or articles placed in the second re-entrant recess at the opposite side of the package are protected against crushing,

(c) said first recess extending lengthwise at least part way about said second recess having rectangular frame configuration,

(d) and including a base sheet supporting said frame core, and there being a second frame core consisting of expanded resin and supported on the base sheet within another first re-entrant recess defined by the package which also defines another second re-entrant recess surrounded by the second frame, the base sheet being foldable to bring said frames into superposed relation protecting articles in said second re-entrant recesses.

(e) and including a cover sheet over a side of the package to cover said first re-entrant recess and said core, and attached to the package.

4,576,283

BAG FOR VACUUM PACKAGING OF ARTICLES

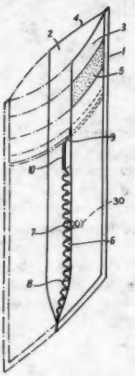
Bernard Fafournoux, 12ter, route de St-Germain, 78560 Le Port Marly, France

Filed Jan. 25, 1984, Ser. No. 573,668

Claims priority, application France, Jan. 25, 1983, 83 01077

Int. Cl.⁴ B65D *81/20*

U.S. Cl. 206—524.8 **10 Claims**



1. A bag for vacuum packaging of articles, said bag comprising:

flexible walls;

a sealable closure, said flexible walls and sealable closure defining an interior of said bag for receiving articles;

an auxiliary chamber;

a wall common to said interior and said auxiliary chamber, said auxiliary chamber being evacuated at the time of the manufacture of the bag;

communicating means for establishing communication through said wall common to said interior of said bag and said auxiliary chamber to permit residual air in said interior to flow into said auxiliary chamber after said bag has been filled, closed and sealed.

4,576,284

CLOSING OF FILLED CAPSULES

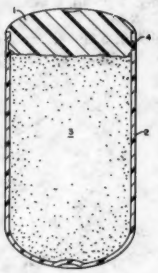
Fritz Wittwer, Lupsingen, and Thomas Raible, Mohlin, both of Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 2, 1983, Ser. No. 557,306

Int. Cl.⁴ B65D *53/06, 85/00*

U.S. Cl. 206—530 **5 Claims**

1. A hard shell capsule for the exact dosage of solid, creamy and liquid substances which comprises a body part, said body part having a closed end, a sidewall extending from said closed end, and an open end, said sidewall having an internal recess extending circumferentially around said sidewall, adjacent said open end and a cap molded in situ, said cap being in engagement with said recess, whereby said open end of said capsule is sealed subsequent to filling.



4,576,285

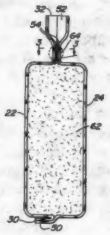
SEALED FLEXIBLE CONTAINER WITH NON-DESTRUCTIVE PEELABLE OPENING AND APPARATUS AND METHOD FOR FORMING SAME

Luigi Goglio, Milan, Italy, assignor to Fres-co System USA, Inc., Telford, Pa.

Continuation-in-part of Ser. No. 496,770, May 20, 1983, Pat. No. 4,518,087. This application Feb. 29, 1984, Ser. No. 584,587

Int. Cl.⁴ B65D *33/16*

U.S. Cl. 206—632 **5 Claims**



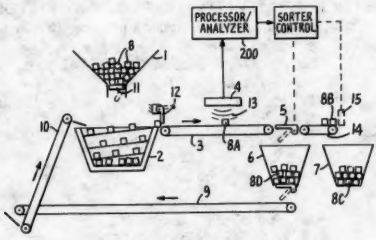
1. A sealed container comprising a flexible sheet material closing off the interior of the container from the ambient atmosphere, said sheet material being resistant to tearing, said container having an opposed pair of walls formed by said sheet material, each of said walls including an inner surface and an outer surface, said container comprising a releaseably sealed mouth portion formed between said walls and of a predetermined length, each of said walls including a first layer on said entire inner surface, said first layer comprising at least two plastic material layers permanently adhered to each other, a portion of one of said first layers at said mouth portion on one of said walls being disposed opposite to a corresponding portion of the first layers at said mouth of the other of said walls, said mouth portion being sealed by the application of a predetermined amount of energy thereto, whereupon portions of the same plastic layer of each of said first layers join in releaseable engagement with each other to form an air-tight interfacial seal therebetween for the entire predetermined length of said mouth portion, said interfacial seal being readily openable by peeling said engaging portions of said first layers from each other to provide ready access to the interior of said container through said mouth portion without tearing said sheet material, said container additionally comprising at least one permanently sealed seam formed by the application of energy in

excess of said predetermined amount to other abutting portions of said first layers of said walls.

4,576,286
PARTS SORTING SYSTEMS

Bruce S. Buckley, San Jose; Edward M. Buckley, Milpitas, and Roy H. Reichwein, San Jose, all of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Jun. 27, 1983, Ser. No. 508,121
Int. Cl.⁴ B07C *5/344*
U.S. Cl. 209—558 **26 Claims**



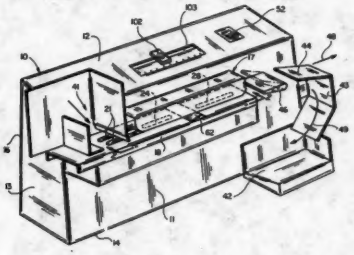
1. Apparatus for parts sorting, that comprises:
parts feeding means to feed a part into a sensing region;
means for transmitting continuous wave energy of a single frequency through the medium surrounding the part in the sensing region where wave energy ineracts with said part;
sensor means positioned to detect wave energy that interacts with the part by virtue of the wave energy directed thereupon, said sensor means comprising a multiplicity of spaced-apart sensors disposed in an array to receive the wave energy at a multiplicity of places after interaction with the part and propagation through said medium to the sensor means;
means for processing the received wave energy into information for each sensor of the sensor means;
means for analyzing said information from the multiplicity of sensors and operable to generate a single sampling signal output representative of a characteristic of said part; and
means for sorting connected to receive said single sampling signal output and operable to sort said part in response to said characteristic;
in which the continuous wave energy is sinusoidal wave energy of a single frequency and in which the multiplicity of spaced-apart sensors are sensitive to specific regions of the part, each sensor providing an electrical output containing at least one of amplitude and phase information which is weighted for each sensor on the basis of the characteristic being sensed, said electrical output being sinusoidal signals whose amplitude and phase vary according to the characteristics of the part.

4,576,287
APPARATUS AND METHOD FOR CHECKING THE CONTENTS OF ENVELOPES AND SORTING DOCUMENTS BY THICKNESS

George H. Bingham; Edward A. Krupotich, both of Los Altos, and Burton J. Rosensweig, Mountain View, all of Calif., assignors to Omation Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 416,668, Sep. 10, 1982, abandoned. This application May 11, 1983, Ser. No. 493,638
Int. Cl.⁴ B07C *1/16, 5/06*
U.S. Cl. 209—601 **6 Claims**

5. In apparatus for determining whether an object is thicker than a predetermined thickness: means for feeding the object along a path, a gauging element positioned for deflection by the object as it travels along the path, the amount of deflection corresponding to the thickness of the object, a pivot arm, means connecting the gauging element to the arm so that the arm is displaced from a rest position by an amount corresponding to the thickness of the object, a first sensor for providing a first signal when the arm is displaced by an amount corresponding to the predetermined thickness, a feeler, means responsive to the first signal for urging the feeler toward the arm,

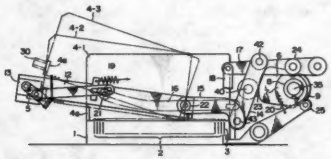


means responsive to the position of the feeler for providing a second signal when the arm is displaced by an amount corresponding to a thickness greater than the predetermined thickness, and means responsive to the second signal for diverting the object from the path.

4,576,288
CARD SORTING MACHINE

Tomomasa Tanaka, Tokyo, Japan, assignor to Tanaka Seiko Co. Ltd., Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 595,974
Claims priority, application Japan, May 10, 1983, 58-69528[U]
Int. Cl.⁴ B07C *5/36*; G06F *7/10*
U.S. Cl. 209—609 **5 Claims**



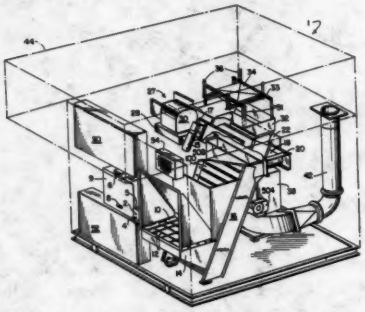
1. In a card sorting machine having a number of selectively raisable select bars supporting thereon a number of coded cards, each of the cards having a coded tooth train at the lower edge thereof and a magnetic piece attached at its front edge and a selecting magnet to move selected coded cards for one pitch of the select bar in the horizontal direction by attracting thereto the magnetic piece and to further move said selected coded cards in an oblique upward direction, while stopping unselected cards, the card sorting machine further comprising:
a card holding magnet provided above and in parallel with the selecting magnet at the time of the separation of the selected coded cards in the oblique upward direction;
a card raising plate movable from a lower position near the magnetic piece of the selected coded cards already separated in the oblique upward direction to an upper position; and
a card raising plate driving mechanism to raise the card raising plate to release the selected coded cards attracted to the card selecting magnet at the time when moved in the oblique upward direction and to have said selected coded cards held by the card holding magnet.

4,576,289

METHOD AND APPARATUS FOR RECYCLING CANS

Steve A. Jarrett, and John F. Krzyston, both of Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 23, 1983, Ser. No. 554,565
Int. Cl.[4] B07C 9/00; G07F 7/06
U.S. Cl. 209—631 17 Claims



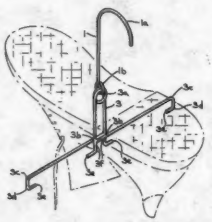
1. In a method for recycling conductive material from a material input comprising separating magnetic material from said material input, separating said conductive material from the balance of said material input and recombining said magnetic material and said conductive material the improvement comprising separating overweight magnetic material from said magnetic material and/or overweight conductive material from said conductive material and recombining either the remainder of said magnetic material and said conductive material, the remainder of said conductive material and said magnetic material or the remainders of said magnetic material and said conductive material.

4,576,290

GRIP HANGER

Donald J. Zigman, 5569 S. 116th St., Hales Corners, Wis. 53130

Filed Feb. 10, 1984, Ser. No. 579,194
Int. Cl.[4] A47F 5/01, 7/08
U.S. Cl. 211—34 1 Claim



1. A single-coil hanger for suspending footwear in an inverted position, comprising:

a hook having a lower end formed as an eye;

a torsion spring having a coil at its upper end which is received by the eye at the lower end of the hook and having a first leg and a second leg which extend downwardly from the coil;

wherein each of said first and second legs is formed inwardly toward the other leg to cross the other leg in approximately the same horizontal plane and each leg is formed downwardly and inwardly and terminates in a first end gripper and a second end gripper, respectively; and

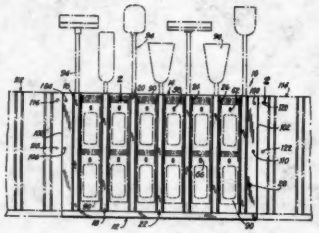
an appendage extends downwardly from each of the first and second legs, said appendage extending downwardly from the first leg being formed toward the second end gripper and terminating in a third end gripper facing the second end gripper and said appendage extending downwardly from the second leg being formed toward the first end gripper and terminating in a fourth end gripper facing the first end gripper so that one article of footwear can be clamped between the first and fourth end grippers and another article of footwear can be clamped between the second and third end grippers.

4,576,291

GRAVITY FEED MERCHANDISE DISPLAY FIXTURE

Robert Stein, Sharon, Mass., assignor to Vining Broom Company, Inc., Springfield, Ohio

Filed Apr. 18, 1983, Ser. No. 485,961
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—49.1 12 Claims



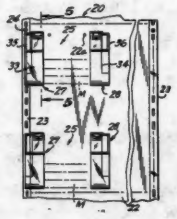
1. Apparatus providing a display stand comprising a plurality of elements each mounting in a plane which extends substantially perpendicular to a base surface, a first portion of said elements being a double walled structure including longitudinally extending walls connected in a substantially parallel relatively closely spaced relation and constructed and arranged to mount a plurality of brooms, brushes, mops or other tools distinguished by a long handle for their operation, with their handles therebetween, a second portion of said elements being formed for the releasable mount thereto of "peg" type merchanidse, said first and second portions of said elements including means providing an interfit thereof and by means of said interfit per se an interconnection of said elements producing a free standing display structure without need for fasteners.

4,576,292

MODULAR DISPLAY UNIT FOR ARTICLES OF MERCHANDISE

George E. Percival, 10 Twain St., Bloomfield, N.J. 07003

Filed Jul. 11, 1985, Ser. No. 754,348
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—49.1 8 Claims



1. A modular display unit for supporting articles of merchandise and adapted to be secured to an upright support structure, said display unit comprising:

(a) a pair of elongated, laterally grooved, posts adapted to be secured to the support structure in vertical orientation and at a horizontally spacing from one another with one groove of one post facing and aligned with one groove of the other post,

(b) an apertured carrier board having a front surface and a back surface, said carrier board being adapted to be engaged by and extend between said posts, with each of the opposite side edges of said board being fitted into the proximate one of said grooves of the adjacent one of said posts, and to be secured thereby to said support structure with said front surface of said carrier board facing away from said support structure and with at least a portion of each of said vertical posts projecting frontwardly of said front surface of said carrier board; and

(c) at least one pair of article-supporting fixture members adapted to be mounted on said carrier board, said fixture members each having a front end wall, a rear end wall, a bottom wall and a side wall extending along one side of said bottom wall between said front and rear end walls,

(i) said side wall of one of said fixture members being located to the left of its associated bottom wall, and said side wall of the other of said fixture members being located to the right of its associated bottom wall, when said fixture members are viewed in the front to rear direction,

(ii) a respective pair of generally hook-shaped prongs extending rearwardly from said rear end wall of each fixture member, said prongs being adapted to enter respective apertures in said carrier board for mounting said fixture members on said carrier board, and

(iii) said side wall of each fixture member and its associated rear end wall being foreshortened at their juncture with each other to define over the entire height of the respective fixture member a step region, the depth of said step region of each fixture member frontwardly of said rear end wall of that fixture member being sufficient, when said prongs of that fixture member are received in a pair of said apertures adjacent and either to the left or to the right of a respective one of said posts depending on whether the side wall of that fixture member is located to the right or to the left of the associated bottom wall, to accommodate the portion of said respective one of said posts which projects frontwardly of said front surface of said carrier board when the latter is engaged by said respective one of said posts,

(iv) said fixture members, when mounted on said carrier board and having their bottom walls substantially in transverse alignment with each other and having their side walls located at the sides of said bottom walls which are directed away from each other, cooperating to define an upwardly open compartment having a split article-supporting surface constituted by said bottom walls and having lateral boundary surfaces constituted by said side walls.

4,576,293

PRODUCE SUPPORT TRAY ASSEMBLAGE

Michael Hinton, 11121 Brenda La., La Habra, Calif. 90631

Filed Feb. 9, 1984, Ser. No. 578,765

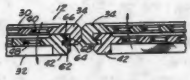
Int. Cl.[4] A47F 5/00

U.S. Cl. 211—127 **7 Claims**

1. A non-metallic support tray assemblage for use in connection with refrigerated produce display cases and the like comprising:

(a) a first tray including a pair of sides and a pair of ends connected to said sides to define a central portion having a multiplicity of spaced apart first apertures adapted for the passage of air therethrough along predetermined paths, at least one of said end portions having first support means for removably supporting said end portion of said first tray within the display case; and

(b) a second tray slidably interconnected with said first tray, said second tray including a pair of sides and a pair of ends connected to said sides to define a central portion having a multiplicity of spaced apart second apertures adapted for the passage of air therethrough along predetermined paths, at least a portion of said second apertures being adapted to be aligned with a portion of said first apertures



in said first tray, at least one of said end portions having second support means for removably supporting said end portion of said second tray within the display case said second tray comprising first and second interconnected portions, said portions being disposed in spaced apart generally parallel planes.

4,576,294

VEHICLE COUPLER DEVICE HAVING MEANS FOR TAKING EXCESS IMPACTS

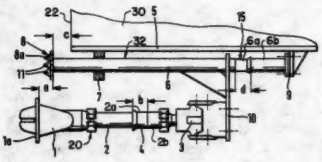
Hilmar Forster, Wolfenbüttel, Fed. Rep. of Germany, assignor to Scharfenbergkupplung GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,307

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228941

Int. Cl.[4] B61G 9/04

U.S. Cl. 213—9 **1 Claim**



1. A coupler device for a rail vehicle, comprising a shock absorbing bar assembly comprising a plurality of telescopic elements including a shock bar, said shock absorbing bar assembly having one end adapted to be secured to the vehicle and an opposite end extending outwardly from the vehicle, a fender secured to said opposite end and having a plate part spaced from the end of the vehicle by a first amount, said telescopic elements including a first impact safety between said shock bar and the end of said shock absorbing bar assembly which is connected to the vehicle, said first impact safety comprising one first impact element movable in respect to another first impact element and permanently deformable upon the occurrence of an emergency impact force, a web plate secured to said shock absorbing bar assembly, a central buffer coupler carried by said web plate, said central buffer coupler having a second impact safety comprising one second impact element movable relative to another second impact element and permanently deformable upon the occurrence of another emergency impact force, said central buffer coupler having one end with a coupler head having a plate part extending outwardly of the vehicle beyond said fender plate part and by

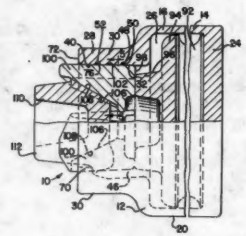
a second amount substantially equal to an amount of movement of said one second impact element relative to said other second impact element, said fender plate part being spaced ahead of said vehicle by said first amount which is at least greater than an amount of movement of said one first impact element relative to said other first impact element, the emergency impact force needed to permanently deform said first impact safety being greater than the emergency impact force needed to permanently deform said second impact safety so that said second impact safety yields before said first impact safety, said central buffer coupler including a resilient buffer device connected between said web plate and said second impact safety for resiliently absorbing normal impacct force which is less than either of the emergency impact forces, said fender including the central fender part connected to said shock bar and a side fender part hinged ot each side of said central fender part, and a shock rod connecting said web plate to each side fender part, said shock rod comprising a plurality of telescopic parts including at least one deformable excess impact part movable in respect to another excess impact part, said shock rod hinged to said web plate for substantially horizontal pivotal movement.

4,576,295

DRAFT GEAR FOR RAILROAD CAR COUPLER SYSTEM

Richard A. Carlstedt, Wheaton, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Filed Feb. 27, 1984, Ser. No. 583,915
Int. Cl.[4] B61G *9/10*
U.S. Cl. 213—32 R **7 Claims**



1. A draft gear for a railroad car coupler system, said draft gear comprising:

a cast housing having an inner section to hold a spring package and an outer friction bore section connecting with said inner section, said friction bore section defined by sidewalls set in a hexagon shaped array with inner surfaces of said sidewalls positioned to form a top and two side equispaced friction shoe seats from adjacent pairs of said sidewall inner surfaces and a radiused corner between said adjacent sides, each said friction shoe seat having a grooved recess defined by an inner and outer groove portion joined by a connecting groove portion positioned substantially perpendicular to said inner and outer groove portions with said connecting groove portion of each said recess being in proximate alignment with said corner of said friction shoe seat respectively and said connecting groove portions of said recesses of said side friction shoe seats having walls positioned on an angle to form an enlarged opening into said side friction shoe seat connecting groove portions; and

insert means forming a rigid unit disposed in each said friction shoe seat grooved recess to provide a film of lubricant between said surfaces of said friction shoe seats and wear surfaces of friction shoes disposable in said housing outer friction bore section,

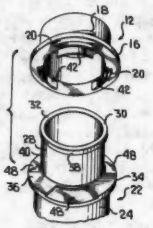
wherein said friction bore recesses may be cast as part of said housing friction bore section by a mold core from a two-piece core box, and a coefficient of friction between said friction shoes and said friction shoe seats is continuously regulated by said film of lubricant to control frictional restraint to movement of said shoes in said seats.

4,576,296

COMBINATION RADIAL LOCKING DEVICE AND INFESTATION SEAL FOR PRESS-SEAL TYPE TRANSFER NECK FINISH

Frank H. Lecinski, Harwood Heights, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Apr. 2, 1985, Ser. No. 719,119
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—31 **12 Claims**



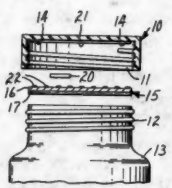
12. In a container, a tubular neck portion, said tubular neck portion having a neck finish including an outer annular recess for receiving a tubular member of a fitment, said recess being defined at ends thereof by upper and lower shoulders for opposing opposite ends of such a fitment tubular member, and said lower shoulder having recessed seats therein for receiving in interlocking relation flap means of a fitment.

4,576,297

TAMPER RESISTANT CLOSURE

Curtis L. Larson, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 553,988, Nov. 21, 1983, abandoned.
This application Jun. 6, 1985, Ser. No. 742,131
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—250 **6 Claims**

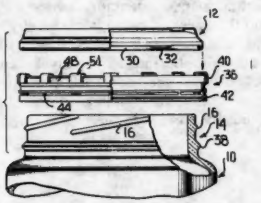


1. A closure for a container having a surface surrounding an opening to the container, a removable translucant cover member removably mounted over said opening in the container, a membrane defining a seal for said container which is bonded in fixed relationship to said surface of said container surrounding said opening, and a deposit of adhesive adhered to the inside of said cover member and to said membrane, said deposit of adhesive being spaced from the surface surrounding said opening and being spaced from the center of said cover whereby relative movement between the cover member and said container will cause a tearing of said membrane by said deposit of adhesive within the area of said opening.

4,576,298
TAMPER INDICATING FITMENT

Elmer J. Bolk, Lombard, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed May 8, 1984, Ser. No. 608,305
Int. Cl.[4] B65G 67/02
U.S. Cl. 215—252 5 Claims

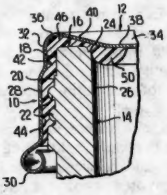


1. A tamper indicating fitment for use in combination with a metal closure of the type having a flared lower skirt portion, said fitment comprising a plastic ring having a lower tamper indicating band secured thereto by circumferentially spaced bridges, said ring having at its end and internal seat for seating against a metal closure lower skirt portion, and releasable locking means disposed above said seat for locking above a metal closure lower skirt portion, said ring having a sleeve extending around and projecting above said seat, and said locking means are carried by said sleeve, said locking means being in the form of a plurality of circumferentially spaced fingers.

4,576,299
CLOSURE CAP WITH IMPROVED TOP-LOAD LEAKAGE RESISTANCE

Frank H. Lecinski, Jr., Harwood Heights, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Oct. 29, 1984, Ser. No. 665,887
Int. Cl.[4] B65D 41/22
U.S. Cl. 215—318 5 Claims

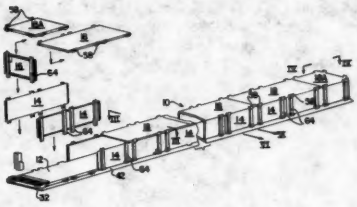


1. A closure cap of the press on/twist off type wherein there is a shell including a skirt and an end panel, and within said shell there is a sealant of a generally inverted L-shape cross section including a generally cylindrical portion adjacent said skirt and an annular portion adjacent said end panel, said annular sealant portion being specifically adapted to engage in sealing relation an end sealing surface of a container in sealed relation, said closure cap being improved by at least that part of said annular sealant portion remote from said skirt being of an increased thickness with the thickness of said part of said annular sealant portion remote from said skirt being sufficient to form a seal with an internal cylindrical surface of a container finish, the thickness of said part of said annular sealant portion being such as to have a container neck finish engaging depth ranging from 0.025 to 0.045 inch as compared to a depth on the order of 0.015 inch for existing closure caps of the same size and shape.

4,576,300
REUSABLE SHIPPING CONTAINER

Edward S. Kedzior, Claremore, Okla., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jul. 3, 1984, Ser. No. 627,377
Int. Cl.[4] B65D 9/18
U.S. Cl. 217—13 23 Claims

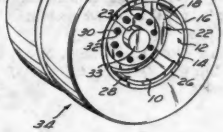


1. A reusable shipping container, particularly adapted for the shipment of tubular product, said container comprising a generally rectangular base adapted to support said product during shipment, generally rectangular side components and end components, with said side components being adapted for edge-to-edge, series connection longitudinally along opposite edges of said base, a plurality of exterior receptacles provided in said base whereby said side and top components can be used to vary the length of said shipping container, a plurality of projecting members provided on said side components and said end components, said projecting members being adapted to mate with and extend into said receptacles provided in said base to removably secure said side components and said end components to said base during assembly of said container and generally rectangular top components having a plurality of receptacles, said projecting members being adapted to mate with said receptacles of said top components to removably secure said components and said end components to said top components during assembly of said container in edge-to-edge, series connection longitudinally relative to said base.

4,576,301
WHEEL PROTECTOR

Bob L. Tedder, 18864 Northam, West Covina, Calif. 91792

Filed Sep. 30, 1983, Ser. No. 537,680
Int. Cl.[4] F16N 31/00
U.S. Cl. 220—1 C 4 Claims



1. A wheel protector tray for shielding a dish-type wheel of a vehicle from contact with lubricants and other material during removal and replacement of an axle of the vehicle through a central opening in the wheel, comprising:

a tray formed to fit inside the dish-shaped portion of the wheel, said tray including a bottom portion, said tray having an inner lip portion and an outer lip portion extending away from said bottom portion and cooperating therewith to form a container for placement in the dish-shaped portion of the wheel below an axle to which the

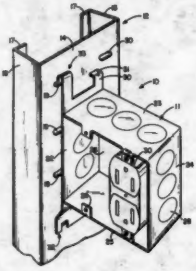
wheel is mounted for receiving lubricants and objects as the axle is removed from the vehicle to prevent such lubricants and objects from contacting the outer surface of the wheel.

4,576,302

ELECTRICAL RECEPTACLE BOX ASSEMBLY

Robert A. Smolik, 670 West Seventh St., St. Paul, Minn. 55102

Filed May 6, 1985, Ser. No. 730,490
Int. Cl.[4] H02G 3/10
U.S. Cl. 220—3.5 16 Claims



13. An electrical receptacle box assembly comprising:

a wall stud with a relatively thin-walled major side member having a mounting hole pattern including first and second longitudinally spaced-apart mounting holes;

an electrical receptacle box having a first side wall carrying first and second fastening means connectable to first and second holes of the mounting hole pattern of the wall stud;

said first fastening means including first, second, and third laterally spaced longitudinal fingers, said second finger being outwardly offset with respect to the first and third fingers forming a wedge-shaped gap for engagement with a lateral edge of the first mounting hole;

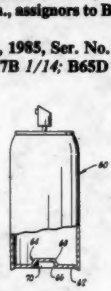
said second fastening means including linear means extendible through and engageable with the second mounting hole when the first fastening means is engaged with the first mounting hole of the hole pattern on the major side member of the wall stud.

4,576,303

RUPTURABLE PRESSURE RELIEVING FLUID CONTAINERS

Arnold L. Mundt; Charles E. Beair, both of Tulsa; Leo J. Naumann, Broken Arrow; Alan T. Roberts, and Ronald J. LaPelle, both of Tulsa, all of Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.

Filed Feb. 21, 1985, Ser. No. 703,867
Int. Cl.[4] F17B 1/14; B65D 51/16
U.S. Cl. 220—89 A 22 Claims



1. A rupturable pressure relieving fluid container apparatus comprising:

an enclosure forming said container which includes a wall of substantially uniform thickness;

a substantially frustum-shaped indentation in said wall which forms a recess therein exteriorly of said container and a corresponding protuberance interiorly of said container;

at least one score formed on the indented part of said wall defining a rupture detachable blowout area; and

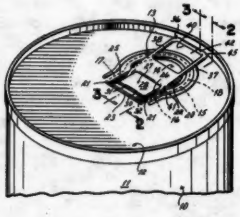
said frustum-shaped indentation being of a size with respect to the thickness of said wall whereby when a predetermined fluid pressure is exerted from within said container on said wall, said indentation inverts and tears along the line of weakness created by said score thereby detaching a wall portion corresponding to said blowout area and relieving fluid pressure therethrough.

4,576,304

EASY-OPEN CLOSURE

John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio

Filed May 15, 1985, Ser. No. 734,041
Int. Cl.[4] B65D 17/34
U.S. Cl. 220—269 21 Claims



1. A closure for beverage containers, said closure comprising:

a top wall adapted to be secured to the container;

a sealing tab defined by a score line within said top wall;

a lifting tab lying within the periphery of said top wall and overlying at least a portion of said sealing tab, said lifting tab comprising a main portion and an arm portion angled downwardly from said main portion;

recessed means carried by said lid portion for restraining and supporting said arm portion for pivotal movement;

fulcrum means disposed on said top wall for engagement with an area of said lifting tab remote from the ends thereof;

a projection on said sealing tab disposed for engagement with the arm portion of said lifting tab when said tab is rotated about said fulcrum means, whereby when said lifting tab is pivoted about said fulcrum means, said arm portion engages said abutment, shearing said sealing tab along said line of weakening and forcing said tab outwardly away from the opening formed in said top wall.

4,576,305

SHEET METAL WALL PANEL AND INTEGRAL OPENER STRUCTURE

William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.

Filed May 20, 1985, Ser. No. 736,080
Int. Cl.[4] B65D 17/34
U.S. Cl. 220—269 20 Claims

1. Easy-access sheet metal wall panel and integral opener structure for a can which provides for Class 1 and Class 2 lever action in severing a portion of such wall panel to provide an opening, comprising

a sheet metal wall panel for a can,

such wall panel having a predetermined contour,

scoreline means of reduced sheet metal thickness defining

the scored periphery of an elongated tear strip in the sheet metal wall panel,

such tear strip being symmetrical about its central longitudinal axis,

an elongated sheet metal opener for severing residual metal of such scoreline means to make such tear strip movable from the predetermined contour of such wall panel,

such elongated opener having a working end and a handle end located at opposite longitudinal ends of its central longitudinal axis, and

unitary rivet means for securing such elongated opener to such elongated sheet metal tear strip with the central longitudinal axis of such opener overlaying and having the same direction as the central longitudinal axis of such tear strip;

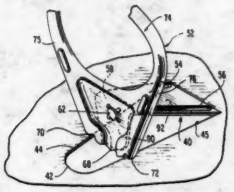
such scoreline means including

an arcuate-shaped scoreline defining one longitudinal end of such elongated tear strip and a pair of elongated scoreline legs extending toward the remaining longitudinal end of such elongated tear strip,

such centerline longitudinal axis of the elongated tear strip intersecting such arcuate-shaped scoreline substantially at its midpoint,

such elongated scoreline legs extending from such arcuate-shaped scoreline, one each on opposite lateral sides of its midpoint,

such scoreline legs being spaced laterally from the central longitudinal axis of the tear strip with the major component of direction of each of such pair of scoreline legs being substantially the same as that of the centerline longitudinal axis of such tear strip;



the unitary rivet means joining sheet metal contiguous to the working end of such opener to sheet metal within the scored periphery of such tear strip contiguous to such arcuate-shaped scoreline end of such tear strip,

such unitary rivet means being symmetrically disposed in relation to the central longitudinal axis of the elongated sheet metal opener and the centerline longitudinal axis of the elongated tear strip;

such working end of the elongated opener including

an initial-contact edge located at its distal end contiguous to its centerline longitudinal axis, and

pivot point contact means located in longitudinally recessed relationship to such initial-contact edge including one pivot point contact on each lateral side of such opener in laterally spaced relationship from the central longitudinal axis of such elongated opener;

such elongated opener being secured to sheet metal of the elongated tear strip such that its initial-contact edge is contiguous to and in overlaying relationship to a portion of such sheet metal tear strip which is contiguous to such arcuate-shaped scoreline at its midpoint so as to cause initial rupturing of such arcuate-shaped scoreline by Class 1 lever action upon movement of such opener handle end in an arc in a direction away from the external surface of such wall panel,

such unitary rivet means being positioned to act as the fulcrum for such Class 1 lever action during such initial rupture;

such scoreline means being further severed after such initial rupture by contact of such working end pivot point means with wall panel sheet metal externally of such tear strip to cause further severing along such scoreline means by Class 2 lever action with such pivot point contact means acting as the fulcrum for such Class 2 lever action as the handle end of the tab opener is continued to be moved in such arc externally of such can.

4,576,306

CLOSURE FOR A CONTAINER HAVING VENT AND TETHERED MEANS

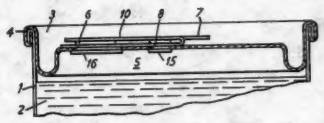
Stephen F. Kelsey, Ilford, and Andrzej J. J. Juty, Harrow, both of England, assignors to Metal Box plc, England

Filed Feb. 7, 1985, Ser. No. 699,243

Claims priority, application United Kingdom, Feb. 18, 1984, 8404320

Int. Cl.⁴ B65D *17/34*

U.S. Cl. 220—271 **10 Claims**



1. A closure for a container of the kind having a pouring aperture and a venting aperture in one end of the container, said closure being moulded in one piece of plastics material and comprising respective annular collar portions adapted to fit tightly within the said apertures, and respective plugs each attached by a rupturable section of the plastics material to the mouth of its annular collar portion to seal the respective aperture, each plug being shaped so that, after breaking of the rupturable section to open the aperture, the plug can be forced back into the collar portion to re-seal the aperture, the two plugs being connected to one another by a connecting member which is flexibly connected to one of the collar portions so as to retain the plugs after opening of the apertures, wherein the connecting member is extended beyond the vent plug to form a pull tab, which is thereby connected directly to the vent plug and through the connecting member to the pouring aperture plug, and the flexible connection of the connecting member to the said one collar portion is provided by flexible tie means extending from a side or sides of the pouring aperture plug to the said one collar portion.

4,576,307

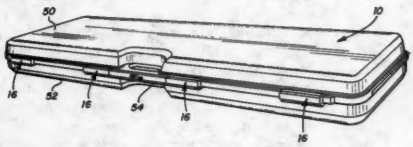
SEPARABLE ELEMENTS HELD TOGETHER BY A SLIDING LATCH

Donald V. Frydenberg, Arlington, Tex., assignor to Doskocil Manufacturing Co., Inc., Arlington, Tex.

Filed Jan. 5, 1984, Ser. No. 568,387

Int. Cl.⁴ B65D *45/16*

U.S. Cl. 220—324 **10 Claims**



1. A container, comprising:

(a) first and second container portions which are relatively movable between an open configuration and a closed configuration, and the container portions cooperating when they are in a closed configuration to define a compartment, and the container portions having first edges which are juxtaposed when the compartment is closed and separated when the compartment is open;

(b) a rail fixed to the first edge of a first one of the container portions, said rail extending linearly along said edge for a significant length but being interrupted by two adjacent gaps;

(c) a pair of posts fixed to the first edge of the second container portion and positioned so as to be insertable within the two rail gaps when the two container portions are in their closed configuration, and said posts having a transverse configuration which matches the transverse configuration of the rail, whereby said posts may be described as forming geometric extensions of the rail when the two container portions are closed; and

(d) the first and second container portions being configured identically and each portion having both a rail at one location and a pair of posts at another location, and wherein the container portions are oriented during assembly of the container so that they are 180 degrees apart, and the first and second container portions having second edges which are permanently joined together with at least one hinge pin, and the posts affixed to one container portion are located at one end of the container and the posts affixed to the other container portion are located at the opposite end of the container; and

(e) slide closure means mounted on the first and second container portions so as to be carried thereby at all times, and said slide closure means having an interiorly facing opening adapted for engaging said linear rail and for being captured by said rail, and said slide closure means having an interior configuration which is slightly larger than the transverse cross section of the rail so as to be slideable along the rail, and said slide closure means having a first position at which the pair of posts are free to move transversely with respect to the rail such that the two container portions may be opened, and the slide closure means being movable to a second position at which it completely envelope the two posts and at least a portion of the rail, whereby the slide closure means may preclude opening of the container by virtue of preventing transverse movement of the posts with respect to the rail.

5. A slide-type latching mechanism, comprising the combination of:

(a) a non-planar rail affixed to a base, and the rail being interrupted by a gap and the gap being sufficiently long as to receive a slide, whereby the slide and rail may become engaged so as to hold the slide on the rail but permit relative movement of the slide with respect to the rail;

(b) an elongated slide having a length which is at least slightly greater than the length of the gap in the rail, and the slide having a longitudinal cavity that opens downwardly into the bottom of the slide, and the cavity being partially bounded by at least one locking element that is configured and positioned so as to establish in the slide a transverse cross-section which complements the cross section of the non-planar rail, and the bottom of the slide having a short and centrally located transverse opening that is as wide as the top of the rail;

(c) a post extending upwardly from the base at approximately the center of the rail gap, and the post being configured so that it functions as a geometric extension of the rail;

(d) the rail and the slide constituting two structural members having an inherent resilience, and the resilience of at least one of said two members being sufficient as to permit temporary deformation in order that one end of the slide may be inserted into the rail gap and the slide may be positioned so that its transverse opening may be juxtaposed with and envelop the post, and the memory of the temporarily deformed member being such as to cause it to return to its original configuration after the slide has been forced into engagement with the rail, whereby the slide may become captured so as to envelop the rail and be slidable therealong;

(e) structural means for filling at least a portion of the rail gap when the captured slide has been moved longitudinally along the rail and away from the rail gap, and said structural means having an external shape which permits it to fit within the longitudinal cavity of the slide, and said structural means being captured and held by the slide when the slide has been subsequently moved to a latching position wherein it rests over the rail gap, whereby anything that is fixed to said structural means will be held adjacent the base when the slide is moved to its latching position over the structural means; and

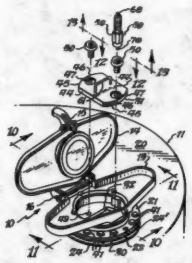
(f) the post in the center of the rail gap having a top that is offset in a longitudinal direction with respect to the lower portion of the post, such that the vertical face of the post is not linear, whereby any structural means that matches the configuration of the post and fills the rail gap will be secured against movement in at least two directions along different axes before the slide is moved to its latching position and secured against movement in three directions after the slide is moved to its latching position.

4,576,308

TANK HATCH OPENING OBSTRUCTING CONSTRUCTION

Jeffrey R. Sullivan, Boston, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed May 10, 1985, Ser. No. 732,671
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—327 **35 Claims**



1. In a thief hatch construction mounted on the top wall of a tank having a wall opening therein, said thief hatch construction including a base plate, a base plate opening in said base plate overlying said wall opening, a plurality of first holes in said top wall surrounding said wall opening, and a plurality of second holes in said base plate in alignment with said first holes for receiving bolts for fastening said base plate to said top wall, an obstructing structure for obstructing said wall opening comprising an adapter plate mounted between said top wall and said base plate, first bolt means extending downwardly from said adapter plate and through at least one of said first holes for securing said adapter plate to said top wall, an adapter plate opening in said adapter plate in registry with said base plate opening and said wall opening, a plurality of third holes in said adapter plate in registry with said first and second holes, second bolt means extending through said first, second and third holes for securing said base plate and said adapter plate to said top wall, an obstructing plate, and locking means for selectively locking said obstructing plate to said adapter plate in obstructing relationship to said adapter plate opening to thereby obstruct said wall opening.

4,576,309

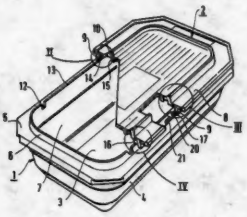
FOOD CONTAINER

Guy Tzifkansky, Fontenay aux Roses, and Jean-Claude Marchais, L'Hay les Roses, both of France, assignors to Cidelcem, Paris, France

Filed Jul. 17, 1985, Ser. No. 755,990
Claims priority, application France, Jul. 20, 1984, 84 11575
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—366 **7 Claims**

1. A vertically upwardly open food container having a substantially rectangular horizontal bottom and integral flared

upright walls terminating in a substantially rectangular horizontal opening and including a horizontal rim near the top thereof which is outwardly rectangular in shape and which surrounds the opening to the container, and a vertical rib extending the walls above the rim, said container being provided with a horizontal cover including firstly a horizontal rim and secondly a vertical rib projecting beneath the rim and engaging around the vertical rib of the container, with the vertical rib of the container having substantially the same height as the vertical rib of the cover, the container including



the improvement whereby the cover rib includes a plurality of shoulders adjacent its top connection to the cover for engaging with the container rib in such a manner that in a first position the cover is in a high position with the bottom of the cover rib being raised above the container rim, and in a second position with the cover being low relative to the first position, the bottom of the cover rib comes close to or into contact with the container rim, whereby, with the cover rib being at a distance from the container rib in the first position considerable ventilation of the container interior occurs.

4,576,310

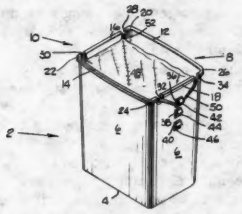
CONTAINER FOR USE WITH PLASTIC BAGS

Charles B. Isgar, 1014 S. Ogden St., Denver, Colo. 80209, and Shirley K. Isgar, 1104 Maxwell, Boulder, Colo. 80302

Filed Jul. 13, 1984, Ser. No. 630,495

Int. Cl.[4] B65D *90/04*

U.S. Cl. 220—404 **10 Claims**



1. In a container supporting a limp, nonself-supporting plastic bag wherein the plastic bag has at least two handles adjacent the open end thereof and wherein each handle forms an opening between the handle and the body of the plastic bag, the improvement comprising:

a hollow container having a bottom and an upstanding peripheral wall secured to said bottom and defining an opening at the top end of said peripheral wall;

a peripheral edge defined by the termination of said peripheral wall;

a first pair of spaced apart notches extending downwardly from said edge into said peripheral wall;

spaced apart portions of one of said handles inserted and retained in said first pair of notches;

a second pair of spaced apart notches located opposite to said first pair of notches and extending downwardly from said edge into said peripheral wall;

spaced apart portions of the second of said handles inserted and retained in said second pair of notches; and

means for securing a portion of each of said handles located between said spaced apart portions to said peripheral wall so that the bottom of said plastic bag is adjacent to said bottom of said container and the open end of said plastic bag is held in an open position so that items may be placed therein.

4,576,311

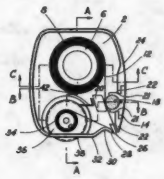
TAB DISPENSER WITH ODOR APPLICATOR

Stuart L. Horton, 9 Woodward Rd., Cromer, New South Wales 2099, and Frederick P. Kann, 2/6 Elizabeth Parade, Lane Cove, New South Wales 2066, both of Australia

Filed Aug. 30, 1983, Ser. No. 527,793

Int. Cl.[4] B65D *83/08*; B65H *5/28*

U.S. Cl. 221—73 **6 Claims**



1. A dispenser device having a housing with a discharge opening, a supply reel within the housing incorporating a mounting tape and a series of tabs releasably and adhesively mounted on the mounting tape, the mounting tape extending from the supply reel to an applicator containing perfume or deodorant and being arranged to apply a coating of the perfume or deodorant to the top surface of the tabs, said applicator being in continuous bearing contact with the mounting tape, the mounting tape extending from the applicator to a discharge means arranged such that the mounting tape is sharply redirected adjacent the discharge opening, the mounting tape extending from the discharge opening to a take-up reel, the arrangement being such that in use as the mounting tape is sharply redirected adjacent the discharge opening, one of said tabs having its top surface coated with perfume or deodorant is released from the mounting tape and is discharged from the discharge opening, the mounting tape from which tabs have been released being taken up by the take-up reel.

4,576,312

FUEL DISPENSING STATION

George E. Swick, Jr., Muskegon, Mich., assignor to Bennett Pump Company, Muskegon, Mich.

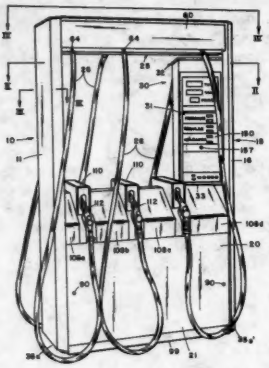
Filed Mar. 19, 1984, Ser. No. 591,000

Int. Cl.[4] B67D *5/06*

U.S. Cl. 222—27 **13 Claims**

1. A fuel dispenser having plural dispensing hoses on each of two faces, said dispenser having a pair of spaced, upright end standards, means for metering and supplying fuel and a housing enclosing said metering means in a chamber positioned between and rigidly connected to the lower portions of said standards; a hollow header extending between and rigidly connected to the tops of said end standards; each of said end standards being formed to provide a vertical passage and a removable cover to enclose the same; fuel dispensing hoses depending from each face of said header; fuel conduits connecting each of said hoses to said metering means, all of said conduits extending upwardly through one of said end vertical passages; an electrical power supply for said metering means and electrical conductors therefor; the conductors for said

electrical power supply being located in the vertical passage of the other end standard and said passage in said other standard



being isolated and sealed from said chamber, said first passage and said header.

4,576,313

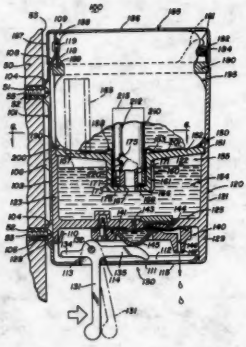
FLUID REFILL POUCH AND DISPENSER

Randel P. Smith, and Robert L. Steiner, both of Chicago, Ill., assignors to Steiner Corporation, Salt Lake City, Utah

Filed May 8, 1980, Ser. No. 146,641

Int. Cl.[4] B65D *17/42*

U.S. Cl. 222—81 **48 Claims**



10. A refillable fluid dispenser comprising a closed wall structure defining a vessel, partition means separating said vessel into a lower fluid reservoir and an upper refill compartment, dispensing means carried by said vessel for dispensing fluid from said reservoir, a refill well extending from said partition means into said reservoir and having a side wall and an inner wall closing the end of said side wall extending into said reservoir, and a piercing member carried by said inner wall and projecting therefrom into said refill well, said inner wall having a refill aperture therethrough providing direct communication between said reservoir and said refill compartment, the inner surface of said side wall having a plurality of longitudinally extending projections thereon extending inwardly toward the associated piercing member and being spaced therefrom a predetermined distance.

4,576,314

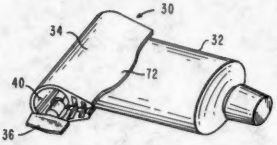
DEVICE FOR SQUEEZING AND WINDING COLLAPSIBLE TUBES

Abe G. Elias, 3300 Skyline Blvd., Apartment 208, Reno, Nev. 89509, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada R3T 2J8

Filed Nov. 16, 1983, Ser. No. 552,349

Int. Cl.[4] B65D *35/28*

U.S. Cl. 222—97 **18 Claims**



1. A device for squeezing and winding a collapsible tube, the device comprising:

a body including a tubular portion and a pair of jaw portions which are integrally supported on the tubular portion wherein the tubular portion defines a cavity for receiving an empty collapsible tube portion and wherein the jaw portions define an axially extending opening into the cavity and the jaw portions extend outward from the tubular portion on respective opposite sides of the opening,

a slotted elongated key for extending axially in the cavity and having a handle portion for winding and pulling an empty portion of the collapsible tube through the opening into the cavity,

said tubular portion also having a thickness defining a flexible and resilient wall portion spaced from the opening which permits the jaw portions at the opening to separate and admit a content containing tube portion of the collapsible tube therebetween,

said jaw portions having a thickness substantially greater than the flexible wall portion thickness to render the jaw portions more rigid than the flexible wall portion,

said jaw portions having inner planar surfaces which extend in parallel planes when the jaw portions are squeezed against the collapsible tube portions to express the contents from the content containing tube portion admitted between the jaw portions, and

said jaw portions having outer surfaces for being readily engaged and squeezed by fingers of a user to squeeze the inner surface against the content containing tube portion between the jaws.

18. A device for squeezing and winding a collapsible tube, the device comprising:

a body including a tubular portion and a pair of jaw portions which are integrally supported on the tubular portion wherein the tubular portion has an axially extending opening and the jaw portions extend outward from the tubular portion on respective opposite sides of the opening for expressing contents from a content containing portion of the collapsible tube,

said tubular portion defining a cavity for receiving an empty portion of the collapsible tube,

a slotted elongated key for extending axially in the cavity and having a handle portion for winding and pulling an empty portion of the collapsible tube through the opening into the cavity,

said key including a tubular shank with a longitudinal slot therein for receiving the closed end of the collapsible tube,

a pin for insertion into and for withdrawal from the tubular shank to secure and to release, respectively, the closed end of the collaspsible tube therein, and

said pin including a shaft with a point on one end and a head on the opposite end wherein the shaft has a diameter sufficiently large so that, upon insertion of the shaft into

the tubular shank, the closed end of the collapsible tube is clamped between the shaft and the tubular shank, the point on the shaft is designed to bend the closed end of the collapsible tube during insertion of the pin into the tubular shank, and the head is designed to facilitate grasping and withdrawal of the pin from the tubular shank.

4,576,315

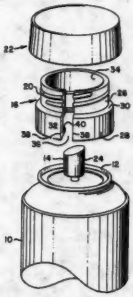
SAFETY CLOSURE FOR AEROSOL CANS

Ralph A. Vitale, P.O. Box 15736, Sarasota, Fla. 33579

Filed May 10, 1984, Ser. No. 609,512

Int. Cl.⁴ B67D *5/32, 5/06*

U.S. Cl. 222—153 **16 Claims**



1. A safety closure for an aerosol can having a peripheral rim, comprising:

a split sleeve having top and bottom openings and a continuous slit extending the height of the sleeve between said openings, said slit forming first and second edges in said sleeve;

said sleeve having externally thereon a screw thread;

said sleeve being normally biased such that the slit is closed and said edges are in contact;

an inwardly extending flange at the bottom of said sleeve defining said bottom opening, whereby said flange can engage below the peripheral rim of the aerosol can after said sleeve has been temporarily flexed apart along said slit to enable said flange to pass over said rim;

a safety cap having an internal screw thread engageable with said external screw thread to prevent said sleeve from flexing apart along said slit and to lock said flange under said rim; and

means, incorporated in said safety cap, for preventing said cap from being simply unscrewed from said sleeve without performing additionally a safety operation.

4,576,316

DISPENSING BAG

Robert D. Foster, St. Anns, Canada, assignor to Spred-A-Bag Inc., St. Anns, Canada

Division of Ser. No. 386,537, Jun. 9, 1982, Pat. No. 4,486,187, which is a continuation-in-part of Ser. No. 159,438, Jun. 13, 1980, abandoned. This application Aug. 16, 1984, Ser. No. 641,479

Int. Cl.⁴ B65D *47/10*

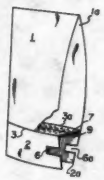
U.S. Cl. 222—541 **8 Claims**

1. A bag for packaging and dispensing particulate matter, comprising:

flexible front and back sections joined together along the side edges thereof and a flexible double end closure, the double end closure comprising an openable outer closure and a flexible inner gusset having a plurality of apertures therethrough, wherein the outer closure may be opened, to expose the apertures of the inner gusset and to permit dispensing of particulate matter therethrough,

wherein the front and back sections and double end closure are integral portions of the same section of flexible sheet material, the double end closure being the central portion and the front and back sections being folded over and superimposed end portions having folded end edges,

wherein the inner gusset of the double end closure comprises an inwardly folded middle portion of the double end closure joined to the insides of the front and back sections along joining lines generally parallel to and approximately equidistant from the folded end edges of the front and back sections, and



wherein the outer closure comprises portions of the double end closure adjacent the folded end edges of the front and back sections, which are sealed together and also sealed to the front and back sections along a sealing line generally parallel to the folded end edges of the front and back sections and remote from the joining lines of the inner gusset, whereby the outer closure is openable by severing the outer closure along a line between the sealing line and the joining lines of the inner gusset.

4,576,317

APPARATUS FOR PREVENTING AIR FROM CONTACTING MOLTEN METAL DURING DISCHARGE THROUGH A SLIDING CLOSURE UNIT

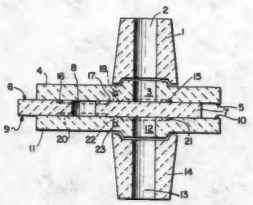
Otto Wenger, Zürich, Switzerland, assignor to Metacon Aktiengesellschaft, Zürich, Switzerland

Filed Aug. 2, 1984, Ser. No. 637,010

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331483

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 222—600 **11 Claims**



1. In a sliding closure unit for regulating the discharge flow of molten metal from a metallurgical vessel, said unit being of the type including at least two refractory plates having therethrough discharge openings, said plates abutting on respective planar sliding surfaces, and said plates being relatively displaceable between open and closed positions to bring said discharge openings into and out of alignment, respectively, the improvement of means for preventing air from flowing to said discharge openings and contacting molten metal therein, said preventing means comprising:

a generally U-shaped recess formed in each said sliding surface, each said recess including a pair of free arms extending toward the other said recess, said recesses being dimensioned such that, when said plates are in said open position, said arms of said recesses overlap, thereby form-

ing a connected recessed area encircling said discharge openings;

one of said plates having therethrough a channel opening into said recessed area; and

means for connecting said channel to a vacuum source and thereby for, when said plates are in said open position, creating a vacuum in said recessed area and preventing air from contacting molten metal passing through said discharge openings.

4,576,318

PANTYHOSE CROTCH EDGE STRETCHING APPARATUS AND METHOD

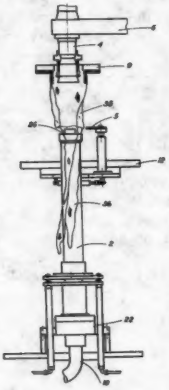
Vinicio Gazzarrini, Impruneta, Italy, assignor to Solis s.r.l., Florence, Italy

Filed Jul. 27, 1984, Ser. No. 634,953

Claims priority, application Italy, Aug. 5, 1983, 9494 A/83

Int. Cl.[4] D05B *21/00, 35/08;* D06C *15/00*

U.S. Cl. 223—52 **20 Claims**



1. Apparatus for removing wrinkles from pantyhose portion surrounding a crotch area to which a gusset is applied, the pantyhose having a pair of leg portions and a panty portion, comprising:

edge stretching means for stretching the edge portion of the pantyhose surrounding said crotch area;

guide means for receiving the pantyhose from a feeding mechanism and transferring the pantyhose to the edge stretching means;

said edge stretching means including receiving means for receiving the pantyhose and means for holding the leg portions in a fixed position, movable means associated with said receiving means for moving the panty portion towards a hollow head associated with a gusset sewing machine for moving the panty portion into said hollow head;

said receiving means including a single vertical tube aligned with said hollow head for receiving both of said legs portions of said pair of leg portions; and

suction means cooperating with said holding means for maintaining the pantyhose portion surrounding the crotch area stretched on said hollow head.

4,576,319

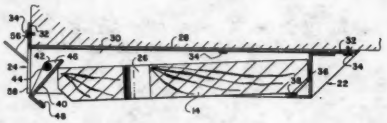
BLOCK STORAGE

Bill G. Brown, Box 1258, Levelland, Tex. 79336

Filed Oct. 5, 1984, Ser. No. 658,320

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—42.41 **3 Claims**



1. In combination with

a. a vehicle having

b. an underside spaced above the ground,

c. a periphery of the underside, and

d. at least one leveling jack mounted on the vehicle;

the improved structure comprising:

e. a block for supporting the jack on the ground,

f. a rack attached to the underside of the vehicle, having

g. a top,

h. an open bottom, and

i. sides connected to the top and spaced apart more than the block width,

j. a stationary inboard plate of the rack spaced away from the vehicle periphery,

k. the inboard plate having an inboard lip that extends toward the vehicle periphery,

l. a movable catch plate journaled to the sides of the rack by a pivot rod near the vehicle periphery for movement about a horizontal pivot axis between

m. an open position wherein a catch lip of the catch plate is spaced from the inboard lip sufficiently for one end of the block to be inserted between the inboard lip and the top of the rack and for the other end of the block to be moved past the catch lip toward the rack top, and

n. a closed position wherein the catch lip is biased toward the inboard lip sufficiently to engage the block so that the block is retained at its ends between the respective lips and the top,

o. a crank rod eccentric to the pivot axis on at least one end of the pivot rod,

p. the catch plate connected to the pivot rod and the crank rod so that the catch plate revolves about the pivot axis responsive to movement of the crank rod, and

q. a spring connected at one end to the crank rod and at another end to the rack at a point spaced away from the periphery and the pivot axis so that the spring biases the catch lip as defined above and acts through a straight centerline extending from the crank rod away from the vehicle periphery,

r. the crank rod oriented to the catch plate so that the spring centerline extends above the pivot axis and the catch lip is biased away from the inboard lip when the catch plate is in the open position, and so that the spring centerline extends below the pivot axis and the catch lip is biased toward the inboard lip when the catch plate is in the closed position.

4,576,320

EYEGLASS HOLDER FOR OPERATIVE ASSOCIATION WITH THE REAR VIEW MIRROR ON A VEHICLE

F. Jerome Mead, 37 Clinton Pl., Morristown, N.J. 07960

Filed Nov. 29, 1984, Ser. No. 676,520

Int. Cl.[4] B60R *7/00*

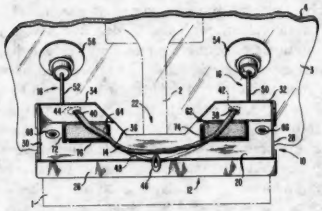
U.S. Cl. 224—311 **3 Claims**

1. A spectacle holder for use in conjunction with a rear view mirror of a vehicle, comprising:

a. receptacle means for supporting a pair of spectacles;

b. means connected to said receptacle means for releasably engaging said pair of spectacles to retain the latter on said receptacle means; and

c. mounting means for mounting said receptacle means adjacent the top of said rear view mirror so the receptacle means is positioned in a substantially horizontal plane,



d. said mounting means including, suction cup means for engagement with a front windshield of said vehicle, stem means connected to said suction cup means and slidably connected to said receptacle means, and

e. strap means connected to said receptacle means for releasably securing said stem means to said receptacle means for slidable movement relative said receptacle means.

4,576,321

APPARATUS FOR CONNECTING A STRIP OF PHOTOGRAPHIC PAPER TO A FLAT CONVEYOR BELT

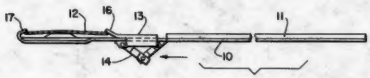
Roberto Marson, Pordenone, Italy, assignor to Gretag San Marco S.p.A., Pordenone, Italy

Filed Jul. 19, 1983, Ser. No. 515,172

Claims priority, application Italy, Jul. 20, 1982, 34031/82[U]

Int. Cl.⁴ B65H *17/34*; G03B *3/13*

U.S. Cl. 226—173 **3 Claims**



1. An apparatus for connecting a strip of material to a flat conveyor belt employed to convey the strip along a path, said apparatus comprising:

an elongated member having a first end thereof hook means for fitting over one edge of a flat conveyor belt, said elongated member having a supporting portion spaced from said hook means and adapted to have attached thereto a strip of material;

a slide member mounted for longitudinal sliding movement along a portion of the length of said elongated member between said hook means and said supporting portion, said slide member having projecting therefrom means for engaging the other edge of the flat conveyor belt, said slide member being movable along said elongated member between an open position relatively away from said hook means, whereat the conveyor belt may be introduced between said hook means and said engaging means, and a clamping position relatively toward said hook means, whereat respective opposite edges of the conveyor belt are engaged by said hook means and said engaging means; and

means for urging said slide member constantly toward said clamping position thereof, said urging means comprising first and second levers hinged to each other and hinged respectively to said elongated member and to said slide member, and a spring acting between said second lever and said slide member to move said slide member to said clamping position thereof.

4,576,322

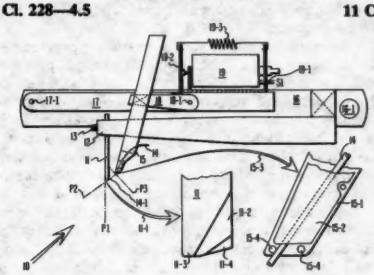
MACHINE FOR ULTRASONICALLY BONDING WIRES TO CAVITY-DOWN INTEGRATED CIRCUIT PACKAGES

Jorge H. Figueredo, Chula Vista, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1984, Ser. No. 650,445

Int. Cl.⁴ B23K *37/00*

U.S. Cl. 228—4.5 **11 Claims**



8. An improved machine for bonding a wire between pads on an integrated circuit die and an integrated circuit package; said machine being of the type that includes a wedge means for transferring heat energy to one part of said wire of sufficient magnitude to bond it to said pads, a clamping means for grasping and pulling on another part of said wire to break it after said bonding operation, and a positioning means for moving said wedge means and clamping means to selectable bonding locations over said die and said package; wherein

both said wedge and said clamping means include respective passageways through which said wire is threaded and slides;

said clamping means moves the portion of said wire between said passageways to a first position where it makes a large angle with said wedge means, and to a second position where it makes a substantially smaller angle with said wedge means; wherein said large angle and said smaller angle differ by at least 15° and

said wedge means is adapted to pass said wire without bending at both said large and small angles.

4,576,323

FILLET-WELDING EQUIPMENT FOR PIPE MATERIALS

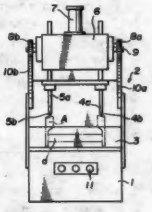
Yutaka Ohnishi, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,529

Claims priority, application Japan, Dec. 9, 1982, 57-186305[U]

Int. Cl.⁴ B23K *27/00*

U.S. Cl. 228—29 **2 Claims**



1. A fillet welding device for welding each end of a first workpiece of circular cross-section to respective separated portions of a second workpiece so that said first workpiece is

transversely rigidly welded between said separated portions, said device comprising:

a base for holding said first and second workpieces such that said first workpiece transversely extends between said first and second separated portions;

a pair of arcuate gear racks separated from one another along the axis of said first workpiece and having a radius of curvature whose center is coincident to the axis of said first workpiece;

a movable member disposed between and supported by said pair of gear racks and including (a) a pair of pinion gears each intermeshed with a respective one of said gear racks, (b) forward and rearward pairs welding torch means extending from said movable member each having a welding tip disposed 90° from the other welding tip relative to the circular first workpiece, each said pair of welding torch means for welding one end of said first workpiece to a respective one of said separated portions of said second workpiece along a 180° weld line therebetween, (c) motor means housed within said movable member and having a pair of shafts respectively connected to said pair of pinion gears for rotatably driving said pair of pinion gears to cause said movable member to traverse an arc defined by said pair of gear racks wherein each said forward and rearward pairs of welding torch means responsively traverses a respective 90° of said respective weld lines to thereby collectively traverse 180° of said respective weld lines whereby said ends of said first workpiece are welded to said respective separated portions of said second workpiece.

4,576,324

GAS PRESSURE WELDING MACHINE

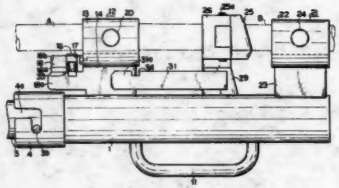
Tadashi Takimoto, Fuchu; Hirotsugu Oishibashi, Musashino; Katsuyoshi Ueyama, Musashino; Muneyuki Ohara, Musashino; Akio Kobayashi, Hachiohji; Keiichi Aoki, Tokyo; Mitsuo Nakamura, Higashi-Kurume, and Kenzo Hagiwara, Hachiohji, all of Japan, assignors to Japanese National Railways and Hakusan Seisakusho Co., Ltd., both of Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,167

Claims priority, application Japan, Feb. 22, 1984, 59-33273

Int. Cl.[4] B23K *37/00*

U.S. Cl. 228—44.3 **4 Claims**



1. A gas pressure welding machine comprising a movable clamp means for clamping one of reinforcing rods to be joined together; a stationary clamp means for clamping the other reinforcing rod; a punching die for punching-shearing a bulge being formed around a joint portion of the reinforcing rods; a bottomed guide cylinder; a pressure application cylinder connected to one end of said guide cylinder and provided with a ram which is advanced or retreated within said guide cylinder; an outer cylinder slidably accommodated within said guide cylinder; an inner cylinder slidably accommodated within said outer cylinder, elastically energized toward said ram by means of a return spring, and adapted to come into collision contact with said ram so as to be movable in one direction in which said return spring is compressed when said ram is advanced and in the other direction in which said return spring is restored to its original position when said ram is retreated; a support leg portion firmly fixed to said guide cylinder for supporting thereon said stationary clamp means; a second support leg portion passed through a guide slot in said guide cylinder and firmly fixed to said outer cylinder for supporting thereon said movable clamp means; a third support leg portion passed through said guide slot in said guide cylinder and a second guide slot in said outer cylinder, and firmly fixed to said inner cylinder for supporting thereon said punching die; said movable clamp means being disposed as opposed to said stationary clamp means and moved close to or apart from said stationary clamp means with said guide slot in said guide cylinder and the inner circumference of said guide cylinder as its guides, and said punching die being interposed between said movable clamp means and said stationary clamp means and advanced or retreated it conjunction with said inner cylinder which is moved by said ram; and a key connection mechanism for detachably connecting said movable clamp means and said punching die; said movable clamp means being advanced in conjunction with said punching die by the advancement of said ram in a state wherein said movable clamp means and said punching die are connected by said key connection mechanism, thereby subjecting the reinforcing rods to gas pressure welding in a butted state to form a bulge around a joint portion of the reinforcing rods; only said die holder and said punching die thereon, upon detached from said movable clamp means, being advanced by the advancement of said ram to punchingshear the bulge.

4,576,325

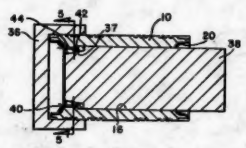
METHOD OF MANUFACTURING A BICYCLE HUB

Walter F. Maurice, San Luis Potosi, Mexico, assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 28, 1985, Ser. No. 706,815

Int. Cl.[4] B23P *11/00*

U.S. Cl. 228—135 **5 Claims**



1. A method of manufacturing a hub for retaining a clutch and expandable shoes of a coaster brake, comprising the steps of:

transportating a supply of tubular material to a work station;

machining the interior of said tubular material to establish first and second diameters therein separated by a first shoulder;

cutting a cylindrical member from said tubular material;

placing said cylindrical member in a first fixture;

placing a ring member having a peripheral surface with a serrated section separated from a second shoulder by a groove in a second fixture;

moving said second fixture with respect to said first fixture to align said ring member with said second diameter of said cylindrical member;

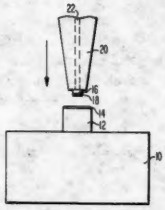
applying a force to said second fixture to bring said serrated section into engagement with said first diameter of the cylindrical member; and

continuing to move said second fixture toward said first fixture to control the distortion of material from said first diameter by said serrated section until said second shoulder engages said first shoulder and thereby establishes a mechanical joint therebetween.

4,576,326
METHOD OF BONDING SEMICONDUCTOR DEVICES TO HEATSINKS

Frank Z. Hawrylo, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 14, 1984, Ser. No. 610,008
Int. Cl.⁴ B21D *39/00*; B23K *31/02, 1/20*
U.S. Cl. 228—171 **3 Claims**



1. A method of thermocompression bonding a semiconductor device having a bonding pad to a heatsink having a bonding pad using a die bonding machine which comprises:

(1) placing the heatsink on a main workstage including heating means of the machine;

(2) aligning a vacuum collet with the top surface of the heatsink bonding pad and locking in that alignment;

(3) burnishing the heatsink bonding pad with the collet so it is parallel to the collet;

(4) transporting the collet to a second workstage to pick up and burnish the device so it is parallel to the collet;

(5) transporting the collet with the burnished device back to the main workstage;

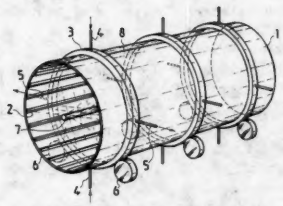
(6) placing the device on the heatsink so that the burnished, parallel bonding pads are in contact with each other; and

(7) applying a desired pressure from the collet and desired heat from the heating means for a time sufficient to provide a bond between the device and the heatsink.

4,576,327
PROCEDURE FOR AFFIXING BEARING HOOPS ON OUTER SURFACE OF LARGE DIAMETER DRUM

Matti Kahilathi, Lahti; Keijo Ventola; Matti Virtanen, both of Kartano, and Pentti Huhta, Salpakangas, all of Finland, assignors to Kone Oy, Helsinki, Finland

Filed Jun. 20, 1984, Ser. No. 622,542
Claims priority, application Finland, Jun. 20, 1983, 832248
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—212 **11 Claims**



1. A procedure for affixing bearing hoops to the outer surface of a large diameter drum, so that said bearing hoops rest on carrier wheels thereunder and by the aid of which wheels the drum is rotated, said procedure comprising:

providing at least two hollow bearing hoops encircling a drum having an open longitudinal joint gap, the bearing hoops and the carrier wheels being placed in proper register with each other;

flowing a heating fluid through said hollow bearing hoops to warm and expand the hoops;

cooling the inner surface of the drum with a cooling fluid flowing from a centrally disposed pipe within the drum to cool and shrink the drum;

mechanically loading the drum in a direction such as to dilate the longitudinal joint gap, so that the drum is urged against the inner surface of the bearing hoops;

securing the drum in this dilated position by the aid of wedges pushed into the longitudinal joint gap;

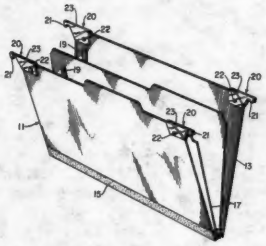
welding inserts into the open longitudinal joint of the drum; and then

stopping the flow of heating fluid to the bearing hoops and allowing the hoops to cool and become affixed onto the drum.

4,576,328
HANGING PARTITION FOLDER

Alan D. Snider, Kew Gardens; Andrzej L. Soporowski, Freeport, and Manfred O. Herbst, Levittown, all of N.Y., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,331
Int. Cl.⁴ B65D *27/00*
U.S. Cl. 229—1.5 R **6 Claims**



1. A hanging document folder comprising:

at least one generally rigid member adpated to retain documents and having two spaced-apart corners at one edge, two sides extending obliquely from the edge at the corners; and

hanging devices pivotally connected at each of said corners such that said hanging devices can be pivoted between a retracted position in which they are substantially flush with the respective two sides of said rigid member, which sides extend significantly beyond said hanging devices, and an extended position in which the hanging devices project from the sides of said rigid member in such a manner that they may engage and slide along rails arranged parallel to each other and perpendicular to the rigid member, a portion of each of said hanging devices contacting a stop in the form of a portion of the edge of said rigid member when in the extended position so as to prevent further pivotal movement beyond the extended position.

4,576,329
COLLAPSIBLE CONTAINER

Paul C. Wright, Brookland House, 46 Kneesworth St., Royston, Hertfordshire, and Robert Gault, 12 Ranmoor Cliffe Rd., Sheffield, both of England

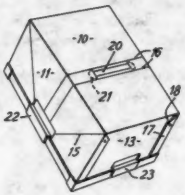
Filed Apr. 26, 1984, Ser. No. 604,011
Int. Cl.⁴ B65D *5/36*
U.S. Cl. 229—41 R **6 Claims**

1. A collapsible container formed from a stiff material comprising:

a bottom having a first end, a second end, two side edges and a middle portion;

a plurality of sides each connected to one of said first end, second end and two edges and said plurality of sides being operatively affixed to adjoining sides for forming a container when in the erected condition;

said middle portion of said bottom includes a spaced pair of fold lines which extend across said bottom and along each of said sides connected to said bottom side edges for permitting said container to be folded substantially in half;



fold lines extending diagonally along each of said sides connected to said bottom side edges from a point adjacent to the intersection of said side edges and said first and second ends to a point adjacent to the intersection of said pair of fold lines and an upper surface of said sides connected to said bottom side edges to permit said sides to be folded inwardly to form a substantially flat article when collapsed; and

a strap operatively connected to said bottom at a position between said pair of fold lines for providing a handle mounted exteriorly of said container when said container is in the collapsed position.

4,576,330

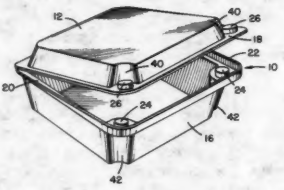
FOOD TRAY WITH LOCKABLE LID

Frank Schepp, Milford, Conn., assignor to Inline Plastics Corporation, Milford, Conn.

Filed Mar. 11, 1985, Ser. No. 710,398

Int. Cl.[4] B65D *1/34*

U.S. Cl. 229—44 R **8 Claims**



1. A container comprising:

a tray portion,

an upper lid portion directly hinged to the rear of said tray portion for movement towards and away from said tray portion to open and close the same,

means for locking said lid portion to said tray portion, said locking means including:

a horizontal flange extending around the periphery of said tray portion,

a horizontal flange on said lid portion adapted to be seated on the horizontal flange of said tray portion, at least one upright cylindrical male element having a cylindrical side wall, a closed end, and an enlarged diameter portion at said closed end, said male element extending upwardly from the horizontal flange on said tray portion towards the lid portion, and

a cylindrical female element having a substantially cylindrical side wall,

a closed end, and an annular rim of a slightly smaller diameter than the enlarged diameter portion of said male element extending towards the tray portion from the corresponding position on the horizontal flange extending about the periphery of said lid portion for receiving the enlarged portion of said male element in snap engagement past said annular rim into frictional engagement with said side wall of said female element and providing a space defined by the bottom outer surface of the enlarged diameter portion of the male element, the inner surface of the cylindrical side wall of the female element, the upper surface of the annular rim of the female element and the exterior surface of the cylindrical side wall of the male element.

4,576,331

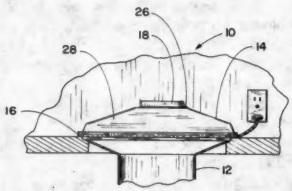
BOOSTER FAN AND AIR DEFLECTOR FOR FLOOR VENTS

Betty L. Harwell, 9643 E. 26th St., Tulsa, Okla. 74129

Filed Nov. 21, 1984, Ser. No. 673,602

Int. Cl.[4] F24F *7/007*

U.S. Cl. 236—49 **1 Claim**



1. A booster fan and deflector for floor vents comprising:

(a) an essentially rectangular open grilled bottom member with a plurality of substantially vertical support legs with openings therebetween wherein the legs are attached to the underside of the outer perimeter of and extend downwardly from said rectangular bottom member and wherein said bottom member is adapted to rest on said legs suspended above and substantially covering a furnace floor vent;

(b) a first substantially vertical sidewall attached along and extending upwardly from one long side of said rectangular bottom member;

(c) a second substantially vertical sidewall attached along and extending upwardly from the other long side of said rectangular bottom member;

(d) a first inwardly and upwardly sloped sidewall attached along one of the short sides of the perimeter of said bottom member;

(e) a second inwardly and upwardly sloped sidewall attached along the other short side of the perimeter of said bottom member;

(f) an essentially square, horizontal top member attached along the upper edges of said sidewalls wherein said top member contains a circular opening;

(g) an essentially circular rotatable grill deflector means operatively attached to said opening in said top member wherein the parallel bars making up said grill deflector means are sloped such as to deflect air passing through said grill deflector means;

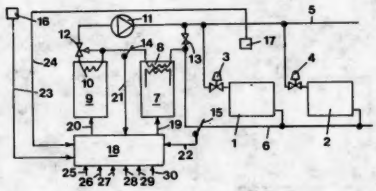
(h) an electric fan and motor means operatively positioned within said booster fan for moving air from the floor furnace vent through said circular rotatable grill deflector means; and

(i) a thermostatic switch means responsive to temperature wherein said switch means turn said electric fan and motor means on and off depending on the temperature of the air passing through said booster fan.

4,576,332
HEATING INSTALLATION WITH HEAT PUMP

Poul Neldeberg, Sonderborg, and Steen H. Olsen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 19, 1985, Ser. No. 702,941
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407795
Int. Cl.[4] G05D 23/00
U.S. Cl. 237—2 B 4 Claims

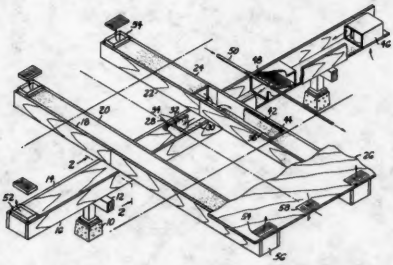


1. A heating installation of the type having a heat pump, radiators having valves, and a control device having a desired value generator for controlling the upstream temperature of said radiators that delivers an effective desired value which is by controlled parameters such as the external temperature and/or a reference room temperature, characterized in that said control device includes means responsive to said external temperature and/or said room temperature to produce a controlled upstream temperature value, a comparator which compares said controlled value with a variable limiting value which is larger than the downstream temperature by a predetermined temperature difference, and that said desired value generator reduces said effective desired value at least down to said variable limiting value when the latter is exceeded by said controlled value.

4,576,333
HEATING SYSTEM

James R. Piper, 9581 Featherhill Dr., Villa Park, Calif. 92661

Filed Aug. 3, 1981, Ser. No. 289,401
Int. Cl.[4] F24F 7/06, 3/044, 3/08; F24D 5/04
U.S. Cl. 237—49 2 Claims



1. A centralized warm air heating system for heating a building having a crawl space beneath the floor which forms a return plenum spaced joists supporting the floor and spaced girders supporting the joists, comprising

first panels extending between two of the spaced girders to form a manifold conduit between the spaced girders;

second panels extending between at least two of the spaced joists to form distribution conduits between the spaced joists, said manifold conduit and said distribution conduits being in communication for airflow therebetween;

at least one inlet from the crawl space beneath the floor into said manifold conduit;

outlets from said distribution conduits to the building through the floor;

return vents through the floor from the building to the crawl space beneath the floor;

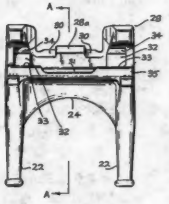
blower means to force air from said inlet to said outlets; and

a heat exchange coil positioned across said manifold conduit.

4,576,334
CAST SHOULDER

Hartley F. Young, West Melton, Australia, assignor to Ralph McKay Limited, Maidstone, Australia

Filed Apr. 26, 1984, Ser. No. 604,182
Claims priority, application Australia, Apr. 29, 1983, PF9119
Int. Cl.[4] E01B 9/30
U.S. Cl. 238—310 5 Claims

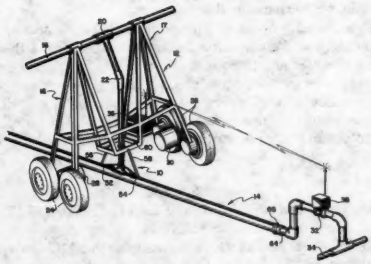


1. A support for an elastic rail clip comprising a first portion adapted to secure said support to a rail tie and a second portion adapted to receive and hold a base portion of a rail clip of the kind having two free arms which lie on the rail flange, said second portion of said support comprising a recess laterally disposed to said rail flange and having an entry remote from said rail flange, said recess being adapted to receive said base portion of a rail clip and includeing a face adjacent said rail flange which incorporates a channel for each free arm of said elastic clip to pass through when moving onto or off said rail flange, said channels being separated by an upstanding portion on said face which prevents accidental ejection of said rail clip.

4,576,335
SLIDING VALVE ASSEMBLY

Robert S. McAbery, Box 1937, Aspen, Colo. 81612

Filed Mar. 30, 1984, Ser. No. 595,559
Int. Cl.[4] B05B 17/00, 3/18; F16L 9/14
U.S. Cl. 239—1 9 Claims



9. A method of irrigating a field comprising the steps of:

placing a main water supply line across the field to be irrigated, which supply line has a slide valve with a discharge

tube for movement along the supply line for selectively irrigating different portions of the field,

said supply line having an inner water-carrying resilient conduit with normally overlapping longitudinal edges and a cylindrical outer flexible cover which is generally coaxial with and surrounds the conduit and has facing longitudinal edges generally aligned with the overlapping portion of the conduit edges, the cover having slide fastener means to hold the facing edges of the cover in abutting relationship to normally prevent separation of the overlapping edges of the conduit, the discharge tube extending between the overlapping edges for the discharge of water from the main supply line into the field;

flowing water through the supply line and into the field through the discharge tube;

clamping the overlapping edges together adjacent the discharge tube during flow of water through the supply line;

periodically interrupting the flow of water through the supply line;

releasing the overlapping edges during interruption of the flow of water;

moving the slide valve and discharge tube along the supply line an incremental distance each time the flow of water through the supply line is interrupted; and

moving the slide fastener means when moving the slide valve and discharge tube to selectively open and close the abutting edges of the cover adjacent the discharge tube.

4,576,336

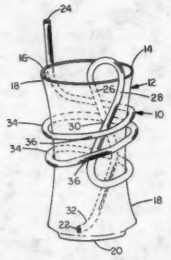
DRINKING STRAW

Nathan Cohen, deceased, late of Jamaica, N.Y., and Mary Cohen, executrix, 147-57 Village Rd., Jamaica, N.Y. 11435

Filed Mar. 29, 1984, Ser. No. 594,996

Int. Cl.[4] A47G *21/18*

U.S. Cl. 239—33 **14 Claims**



1. A drinking straw for use with a drinking vessel, said straw comprising

a hollow tube having a continuous fluid flow path between inlet and exhaust ends,

and a plurality of turns intermediate said ends and interconnecting said ends into a unitary straw having a fluid path of singular uninterrupted construction in which certain of said intermediate turns cross each other to engage therebetween and with the inner and outer walls of a drinking vessel to grip the walls of the drinking vessel theretween to retain the straw connected with the drinking vessel.

4,576,337

ARRANGEMENT FOR OPERATING DUAL FLUID SYSTEMS

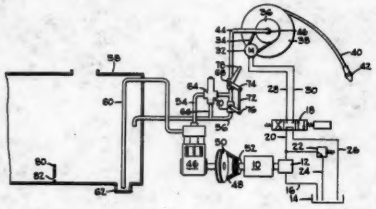
Steven W. Post, Jonesboro, Ark., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 24, 1984, Ser. No. 583,519

Int. Cl.[4] B67D *5/365*; B05B *9/00*

U.S. Cl. 239—127 **1 Claim**

1. In a sewer cleaner having an engine, a water tank, a hose reel, a water pump having an operating output connected to draw water from said tank, and a hydraulic pump and motor connected to rotate the hose reel in either direction, drive means uninterruptably connected to said engine and said pumps to continuously drive both of said pumps, supply and return conduits connecting said water pump to said hose reel and said tank respectively, and valve means in said conduits and having a supply position in which said output is directed only to said hose reel and a recirculate position in which said output is directed only to said return conduit; the improvement comprising:



a baffle having a continuously open orifice in the bottom of said tank, the orifice having a cross sectional area to restrict flow therethrough to a rate less than said output; whereby when operating with said valve means in said supply position and said water pump breaks its prime, moving said valve means to its recirculate position permits the rescirculated water to combine with the water discharged through said orifice to provide water volume sufficeint to re-establish prime to said water pump.

4,576,338

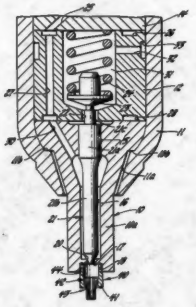
FUEL INJECTOR WITH HOOP NOZZLE SPRAY TIP

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1984, Ser. No. 645,278

Int. Cl.[4] B05B *1/32*; F02M *47/00*

U.S. Cl. 239—452 **3 Claims**



1. A fuel injection nozzle with hoop nozzle spray tip including a valve body means having a stepped bore therethrough to define at one end of said valve body means an outlet passage with a valve seat encircling the inboard end of said outlet passage; a passage means in said valve body means in flow communication at one end with said stepped bore inboard of said valve seat and being connectable at its opposite end to a source or pressurized fuel; an injector valve means movable in said valve body means relative to said valve seat to control flow to said outlet passage; a hollow, closed end, inner plug valve element operatively fixed to said valve body means so as to serve as an extension of said outlet passage; said inner plug

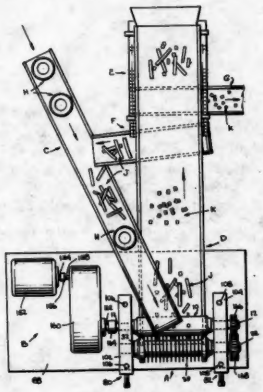
valve element having an outer peripheral valve seat surface with an annular groove therein and having spaced apart port passages for effecting flow communication between said outlet passage and said annular groove; and, a cylindrical outer hoop valve element with a straight thin annular hoop-skirt valve of predetermined radial thickness operatively fixed to said valve body means with said hoop-skirt valve in shrink-fit encirclement of said inner plug valve element so as to overlie said annular groove whereby said hoop-skirt valve is prestressed and is operative as an integral hoop valve which is adapted to expand radially relative to said inner plug valve element, when said passage means and said outlet passage are supplied with fuel at a predetermined high pressure as controlled by said injector valve means, to form therewith a fuel discharge annulus.

4,576,339

SCRAP TIRE CUTTING APPARATUS

Robert H. Snyder, Grosse Pointe Park, and Eric O. Tolonen, Gladwin, both of Mich., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed May 10, 1983, Ser. No. 493,400
Int. Cl.⁴ B02C *4/00*
U.S. Cl. 241—120 **21 Claims**



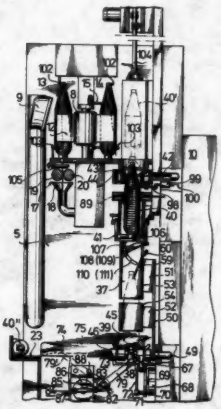
1. Apparatus for cutting scrap tires, comprising:
(A) a frame;
(B) a cylindrical anvil roll mounted in said frame for rotation about its longitudinal axis;
(C) a blade roll mounted in said frame for rotation about an axis parallel to the rotational axis of said anvil roll;
(D) a plurality of axially spaced roller blades of predetermined diameter fixed to said blade roll and rotatable therewith so that said blades and said anvil roll define a nip therebetween into which tires to be cut can be drawn,
(E) a pair of axially spaced thrust wheels carried by said blade roll,
(1) said thrust wheels being positioned outboard of said roller blades,
(2) said thrust wheels being at least equal in diameter to said predetermined diameter of said roller blades;
(F) drive means for rotating said rolls in opposite directions to draw scrap tires into the nip between said roller blades and said anvil roll; and
(G) biasing means constructed and arranged to force one of said rolls relatively toward the other of said rolls to bring the outer peripheries of said anvil roll and said thrust wheels into hard contact with one another, thereby to maintain a predetermined positional relationship between the peripheral surfaces of the roller blades and the peripheral surface of the anvil roll notwithstanding the separating forces generated therebetween due to the movement therethrough of scrap tires being cut between such surfaces.

4,576,340

DEVICE FOR DEPOSITING AND KEEPING THE THREAD END IN THE COP TUBE OF A SPINNING COP PASSED ON FROM A COP PREPARATION STATION TO TRANSPORTING MEANS

Ulrich Aretz, Korschenbroich, and Heinz Bühren, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,627
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244378
Int. Cl.⁴ B65H *67/06*
U.S. Cl. 242—35.5 A **11 Claims**



1. Device for depositing and keeping a thread end in a cop tube of a spinning cop from a cop delivery point of a cop preparation station to cop transporting means, comprising a pivotable chute with upper and lower ends disposed between the cop delivery point and the cop transporting means for receiving a spinning cop with a dragged-along thread end, a switchable suction device disposed at said lower end of said chute for supplying the cop tube with suction, and a device for tilting said chute from a vertical position to a horizontal position, said tilting device including means for limiting acceleration and deceleration of the spinning cop in said chute during tilting.

4,576,341

COP TRANSPORTING SYSTEMS FOR AN AUTOMATIC WINDER

Isamu Matsui, Kyoto; Hiroshi Uchida, Shiga; Kazuo Nakanishi, Uji; Masaharu Kirisake, and Akira Shimano, both of Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Mar. 4, 1983, Ser. No. 472,156
Claims priority, application Japan, Mar. 8, 1982, 57-36197; Apr. 15, 1982, 57-63078; Jul. 19, 1982, 57-12654
Int. Cl.⁴ B65H *67/06*
U.S. Cl. 242—35.5 A **18 Claims**

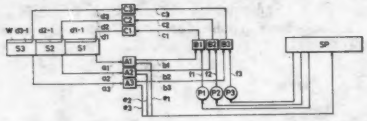
1. A cop transporting system for an automatic yarn winder including a number of winding units, comprising:
means for dividing said automatic winder into a plurality of sections, each section including a plurality of said winding units, each of said sections being adapted to wind a different type of yarn;
a plurality of cop supplying passages, in like number as the

plurality of sections, each of said cop supplying passages being formed along said winding units so as to supply a differing section of the automatic winder;

a plurality of cop supply devices, in like number as the plurality of sections;

a plurality, in like number as the plurality of sections, of means for transporting cops fed out from said cop supply devices to the cop supply passages;

said plurality of means for transporting cops corresponding to said plurality of cop supply devices, to said plurality of cop supplying passages, and to said plurality of sections, in



a specific one-to-one correspondence such that different kinds of yarns may be wound in the respective sections of the winder; and

a plurality of hollow disk-formed trays for transporting cops, each of said trays including a hollow peg formed uprightly at the center of said tray, said pegs being adapted to removably fit within and support hollow wooden bobbins forming cores of said cops;

whereby said trays are transported on said means for transporting cops such that said bobbins are substantially vertically oriented.

4,576,342

APPARATUS FOR LIFTING A WOUND YARN PACKAGE

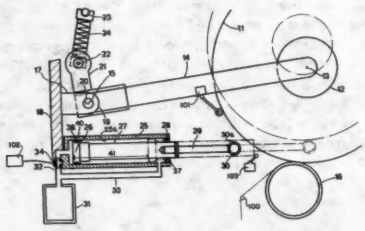
Peter Schwengeler, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jun. 4, 1984, Ser. No. 616,675

Claims priority, application Switzerland, Jun. 10, 1983, 3190/83

Int. Cl.[4] B65H *63/00, 63/024, 63/08*

U.S. Cl. 242—36 **20 Claims**



1. An apparatus for lifting a wound yarn package having an outer surface and a lengthwise axis from a drive roll serving for the drive thereof on a textile machine, comprising:

a package support member for lifting and supporting the yarn package;

said package support member being provided with a forward package contact region for contacting the yarn package and extending substantially parallel to the lengthwise axis of the yarn package;

means cooperating with said package support member for moving said package contact region into a package lifting position against a lower portion of the outer surface of the yarn package during a yarn package lift-off movement involving a movement of the package support member substantially normal to the package contact region;

said means for moving the package support member comprising a piston-and-cylinder unit composed of a cylinder and a piston reciprocatable within said cylinder;

said piston being provided with a piston rod fixedly connected at an end thereof remote from the piston with said package support member;

means for subjecting said piston to a drive force effective during a predetermined time interval in order to accomplish the yarn package lift-off movement;

means for returning the package support member into an initial position where it does not support the yarn package by applying a continually operative return force which is small relative to the drive force produced by said subjecting means;

said piston, said piston rod and said cylinder of said piston-and-cylinder unit coacting with one another such that a pressure of the wound yarn package upon said forward package contact region produces a tendency to rotate said piston and said piston rod within said cylinder in a plane extending substantially perpendicular to the lengthwise axis of the wound yarn package;

said cylinder coacting with said piston and said piston rod to produce forces countering said tendency to rotate; and

said forces overriding said continually operative return force and thereby restraining said package support member in said package lifting position.

4,576,343

DOUBLE SUPPORTING ROLLER WINDING MACHINE

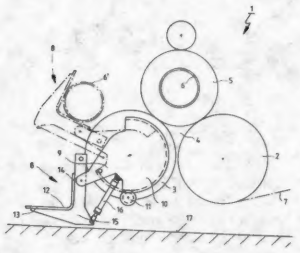
Siegbert Scheuter, Herbrechtingen, and Friedrich Kuhn, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,160

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328517

Int. Cl.[4] B65H *17/12, 19/26*

U.S. Cl. 242—66 **6 Claims**



1. A double supporting roller winding machine adapted for winding material webs, such as paper or board webs, onto core tubes disposed in a roller bed by a core tube insertion device, said core tube insertion device being mounted on pivot levers and extending along one of said supporting rollers and having an insertion trough with an angular cross-section, characterized in that said one supporting roller along which said core tube insertion device extends is not looped by the web, and said insertion trough is mounted pivotally between said insertion trough and said pivot levers so that said insertion trough is operable in a selected one of an insertion mode and an access mode, when in the insertio mode said insertion trough is movable to insert a new core tube and when in the access mode said insertion trough is swivelled relative to said levers so as to be selectively moveable to any one of a plurality of vertical positions wherein one of the sides of said trough is continually maintained in a generally horizontal disposition.

4,576,344
POLYESTER FILM ROLL

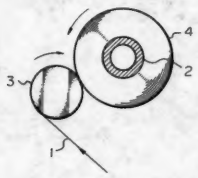
Ichitaro Sasaki, Izumi; Takashi Mori, and Tadao Tsuyuguchi, both of Ogaki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 633,082, Jul. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 372,842, Apr. 29, 1982, abandoned. This application Jul. 18, 1985, Ser. No. 756,920

Claims priority, application Japan, May 6, 1981, 56-66937; Mar. 9, 1982, 57-35760

Int. Cl.[4] B65H *18/10, 18/16*

U.S. Cl. 242—67.1 R **2 Claims**



1. In a process for producing a polyester film roll by winding a polyester film having a thickness not greater than 25 microns and a centerline average surface roughness (Ra) of from 0.001 to 0.5 microns; the improvement for preventing the formation of wrinkles in the film roll over a long period of storage, comprising controlling the hardness (H) of the film roll to a value satisfying the relationship:

$$H \geqq 0.67x^3 - 10.61x^2 + 55.54x - 1.16$$

wherein $x = ln\ (1/Ra)$, by bringing a touch roll into contact with the film roll in accordance with a surface-center-winding method, said touch roll having a peripheral surface hardness (F) satisfying the following relationships (II) and (III):

$$F \leqq 239.14 \times (Ra)^{0.28} \text{ when } Ra \leqq 0.044 \text{ microns} \quad \text{(II)}$$

and

$$F \leqq 100 \text{ when } Ra > 0.044 \text{ microns} \quad \text{(III)}.$$

4,576,345
MAGNETIC-TAPE CASSETTE WITH A LATCHING COVER PLATE

Karel G. M. Koken; Hubertus F. W. van de Kerkhof; John C. J. Olierook, and Cornelis M. Be ersbergen van Henegouwen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

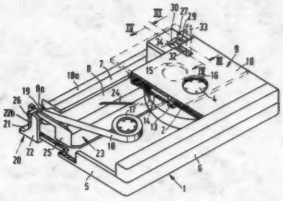
Continuation-in-part of Ser. No. 623,587, Jun. 22, 1984, abandoned. This application Mar. 29, 1985, Ser. No. 717,766

Claims priority, application Netherlands, Apr. 2, 1984, 8401028

Int. Cl.[4] G11B *23/04*

U.S. Cl. 242—198 **19 Claims**

1. A magnetic-tape cassette comprising: a housing having first and second major walls which are parallel to one another, two side walls, a rear wall, an opening at the front which extends back into the first major wall, and a partition which separates this front opening from the interior of the housing; two reel hubs supported between the major walls so as to be rotatable about axes which extend perpendicularly to the major walls, the first major wall having two openings through which the drive spindles of a magnetic-tape-cassette apparatus can be coupled to the reel hubs, and a magnetic tape being wound around the reel hubs with a part of the tape extending across the front opening; a front cover movable between closed and open positions and comprising a main portion which in the closed position of the front cover covers the front opening and the part of the magnetic tape which extends across the front opening, and side flanges which are situated one adjacent each side wall of the housing and which are pivotally connected to said side walls; and a sliding plate which is situated on the outside of the housing and which comprises a main portion which is situated adjacent the first major wall of the housing, the sliding plate being slidably guided on the housing for movement parallel to the first major wall towards the rear wall from a closed position in which it latches the front cover in the closed position and in which the main portion of the sliding plate covers the front opening where this opening extends back into the first major wall to an open position to unlatch the front cover and to give access to the front opening for the passage thereinto of tape-withdrawal means of a magnetic-tape-cassette apparatus, characterized in that the second major wall is imperforate over its entire area and the main portion of the front cover is contiguous with this wall in the closed position of said cover and in that the main portion of the sliding plate extends rearwardly beyond the openings in the first major wall in the closed position of the sliding plate to cover said openings and has two apertures which expose said openings when the sliding plate is in the open position, the sliding plate being latched in the closed position by at least one latching member which comprises a latching portion and an actuating portion, the main portion of the sliding plate being provided with a slot or groove which extends rearwardly from the front edge of the main portion of the plate, and the actuating portion being arranged to project into the slot or groove near the rear end thereof in the closed position of the sliding plate.



4,576,346
SEEKER HEAD FOR A TARGET SEEKING MISSILE

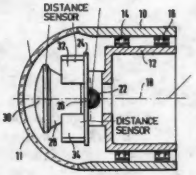
Roland Gauggel, Salem-Grasbeuren, and Reiner Eckhardt, überlingen, both of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnic GmbH, Überlingen, Fed. Rep. of Germany

Filed May 9, 1984, Ser. No. 608,383

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317232

Int. Cl.[4] F41G *7/22*

U.S. Cl. 244—3.16 **5 Claims**



1. Seeker head for a target seeking missile, which comprises a seeker adapted to be directed to a target, characterized in that several distance sensors (32,34) are angularly spaced about the

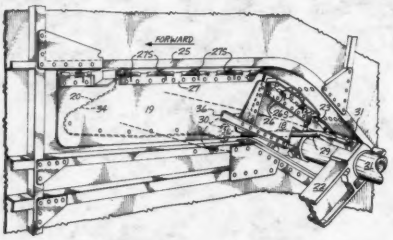
optical axis of the seeker (28) on a part (24) in the seeker head (10), the seeker (28) being mounted on said part (24), and said part (24) being adapted to be directd to the target together with the seeker (28).

4,576,347

FLAP TORQUE TUBE SLOT SEAL

Allan W. Opsahl, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 30, 1984, Ser. No. 666,524
Int. Cl.[4] B64C 7/00
U.S. Cl. 244—130 3 Claims



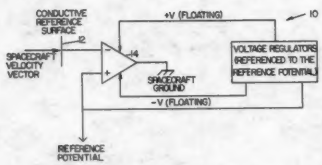
1. Apparatus for blocking airflow through an opening in the side of an aircraft fuselage adjacent to an inboard wing trailing edge flap, comprising: said flap having a torque tube and being translatable between a forward position and an aft position spaced from said forward position; said fuselage side opening being a curved slot for receiving said flap torque tube therethrough and providing clearance for said flap torque tube during extension and retraction of said flap: doors mounted adjacent to the curved slot opening for blocking passage of air through the slot to the upper surface of said flap when said flap is in a fully extended position; and cam means mounted to said flap torque tube for opening said doors to expose the curved slot opening in response to retraction movement of said flap.

4,576,348

METHOD AND APPARATUS FOR ESTABLISHING A REFERENCE POTENTIAL ON SATELLITES IN PLANETARY IONOSPHERES

Don R. Zuccaro, Garland, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Jun. 28, 1983, Ser. No. 508,470
Int. Cl.[4] B64G 1/54, 1/44; H01G 1/08
U.S. Cl. 244—173 5 Claims



1. Apparatus for use on spacecraft having a ground reference and having a solar array, to establish a reference potential near the ionospheric plasma potential, comprising:

a conductive reference surface for disposition on the spacecraft to face in the direction of motion, for collecting ions and adjusting to a plasma potential;

an operational amplifier having inverting and noninverting inputs and an output, with the inverting input being connected to the conductive reference surface; and

a power source for powering the amplifier, said power source providing floating positive and negative voltages referenced to the potential at the noninverting input of the amplifier;

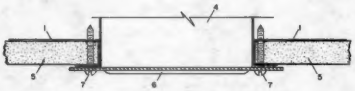
the output of said amplifier being connected to drive against spacecraft ground until the voltage at the noninverting input is substantially equal to the voltage at the inverting input, whereby the reference potential established at the noninverting input is the same as the potential on the reference surface.

4,576,349

AIR DUCT REGISTER MOUNTING CLIP

James C. Dearing, P.O. Box 178, Talbott, Tenn. 37877

Filed Mar. 24, 1983, Ser. No. 478,632
Int. Cl.[4] G12B 9/00
U.S. Cl. 248—27.1 2 Claims



1. A one-piece, self-contained mounting clip for attaching an air duct register to an air duct installed in an opening in a wall having a front surface and a back surface, wherein said air duct extends through said wall opening beyond said front wall surface, comprising a thin rectangular sheet of pliable metal having at one end a first portion with a circular hole arranged therein, said circular hole having a center point located on the longitudinal center line of said sheet; and a second portion with a narrow, elongated slot having the same longitudinal center line as said sheet and extending from a first point adjacent said circular hole to a second point adjacent an end of said sheet opposite said one end, the width of the narrow slot being less than the diameter of said circular hole; said clip bendable in a transverse direction relative to the longitudinal centerline of said clip such that said first portion forms a mounting tab on the first surface of said wall and said second portion extends into the wall opening for a distance corresponding to the thickness of the wall at said opening and across the back wall surface directly behind said mounting tab to thereby substantially conform to the wall opening, so that the portion of the air duct extending beyond said wall opening may be bent over said mounting tab and a threaded fastener installed through aligned mounting holes in said register and said air duct, and through said circular hole and said elongated slot, said slot defining an infinite range of positions along the length of the slot which engage said threaded fastener, the edges of said elongated slot deformed upon installation of said threaded fastener to form burrs which hold the clip in place when the threaded fastener is removed.

4,576,350

PORTABLE BAG FILLING STAND

James Bond, 527 W. South St., Anaheim, Calif. 92805

Filed May 24, 1984, Ser. No. 613,738
Int. Cl.[4] B65B 67/12
U.S. Cl. 248—97 18 Claims

18. A low-cost light-weight portable modular multi-bag filling stand adapted to quick field assembly and easy disassembly for compact transport and storage comprising:

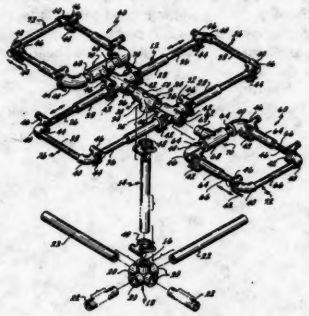
a single vertical support tube having an upper end and a lower end;

a first fitting at said lower end for removably accepting a plurality of co-planar tubular legs in perpendicular relationship to said vertical support to thereby define a base;

a dual bag support frame on said vertical support, said frame comprising a tubular cross-member having opposite ends and including a central fitting slidable along said vertical support for selectively positioning said frame therealong and an end fitting at each said end, each end fitting accept-

ing two tubular arms perpendicular to said cross-member to thereby form a horizontally planar H-shaped structure, a U-shaped section telescopically slidable into each pair of arms of said H-shaped structure form two bag supports of independently adjustable dimensions and provided with hook means for suspending a bag on each side of said cross-member thereby imposing a balanced load on the single vertical support;

each of said end fittings including an end socket adapted to



receive a mating fitting on a detachable single bag holder module; and

two single bag holder modules each comprising two mutually telescoping U-shaped sections forming a rectangle of variable length, one of said U-sections including a fitting mateable to one of said end sockets on the cross-member;

whereby said bag stand is readily field-convertible between a dual and a quadruple bag stand while maintaining a balanced load on said single vertical support in either dual or quad configurations.

4,576,351

PORTABLE STROKE VICTIMS ARM REST

T. A. Brink, Rembrandstraat 96, 5301 SA Zaltbommel, Netherlands

Filed Jun. 15, 1984, Ser. No. 621,156

Int. Cl.⁴ A47C 7/54

U.S. Cl. 248—118 **7 Claims**

1. A portable stroke victim's arm rest adapted to provide multi-positional means of comfort for the user's forearm in a position with the hand elevated above the elbow to prevent the accumulation of fluids in the hand and wrist area, the improvement comprising:

a support member having a generally horizontal shelf member and a generally vertical brace member eminating downwardly therefrom at substantially right angles from one side of said shelf member;

u-shaped height adjusting members operatively mounted with said support member being adapted to securely position said portable stroke victims arm rest on an arm of a chair, sofa or the like and further adapted to raise and lower the ends of said support member to achieve various heights and angles;

said u-shaped height adjusting members include spaced parallel leg members having a cross member therebetween at one end thereof;

a stub shaft located medially between the ends of the leg members, connected therebetween and forming with said leg members a guide for stably receiving an arm of a chair;

a contoured, cushioned arm support moveably coupled to said support member including a cushioned substantially horizontal support and a cushioned upwardly extending wall along said horizontal's support outer edge and being substantially at right angles therewith; and

said substantially horizontal support evolving into an elevated arcuate end portion which is contoured for and accommodates the hand and wrist area in an elevated position with respect to the horizontal to thereby enhance the natural gravity encouraged flow of fluids necessary for the physical well being of stroke victims.

4,576,352

EXERCISE TREADMILL

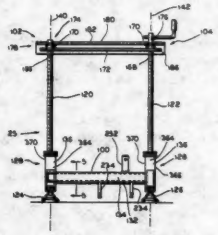
Ralph Ogden, Munster, Ind., assignor to Ajay Enterprises Corp., Delaran, Wis.

Division of Ser. No. 226,766, Jan. 21, 1981, Pat. No. 4,374,587, which is a continuation-in-part of Ser. No. 175,516, Aug. 5, 1980, Pat. No. 4,344,616. This application Sep. 27, 1982, Ser. No. 425,058

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.⁴ F16M 11/00

U.S. Cl. 248—188.4 **5 Claims**



1. In a screw and nut load support device, including a rotatable rectilinear screw member including an externally threaded portion, means for supporting the screw member in an upright position against loads acting longitudinally and downwardly of said screw member, a load bearing nut assembly threadedly mounted on said screw member threaded portion in load transmitting relation thereto for applying to said screw member loads acting longitudinally and downwardly of said screw member, means for rotating said screw member about its said longitudinal axis for threadedly shifting said nut assembly longitudinally of said screw member threaded portion, and means for holding said nut assembly against rotation with said screw member,

the improvement wherein said nut assembly comprises:

a tubular member received about said screw member threaded portion and including means for applying to same said loads acting downwardly of said screw member,

a first nut member threadedly received on said screw member threaded portion,

said nut member being keyed to said tubular member adjacent the lower end of said tubular member against rotational movement relative thereto,

and a second nut member threadedly received on said screw member threaded portion,

said second nut member being keyed to said tubular member above said first nut member for lost motion movement

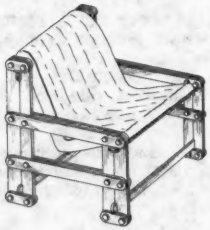
thereof longitudinally of said tubular member and against rotational movement relative to said tubular member,
with said tubular member being in load transmitting relation to said first nut member to the exclusion of said second nut member,
and said first nut member being in threaded load transmitting relation to said screw member to the exclusion of said second nut member.

4,576,353

CARCASE, FAVORABLY FURNITURE-CARCASE

Hidvégi Valéria, Budapest, Hungary, assignor to Kozponti Valto-Es Hitelbank RT, Budapest, Hungary

PCT No. PCT/HU82/00062, § 371 Date Jul. 26, 1983, § 102(e) Date Jul. 26, 1983, PCT Pub. No. WO83/01890, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 25, 1982, Ser. No. 522,375
Claims priority, application Hungary, Nov. 26, 1981, 3544/81
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—165 9 Claims



1. A furniture framework comprising:
column members constituting elongated flat bars having narrow sides, two end regions, and wherein each of said column members has notches within a narrow side thereof remote from said end regions;
columns formed by respective pairs of said column members attached to each other in a narrow side-by-side arrangement, each of said column members including respective through holes normal to flat faces thereof in at least said two end regions;
coupling members constituting elongated flat bars extending normal to said pairs of column members and overlapping said end regions, said coupling members having respective through holes;
releasable clamps insertably carried by said through holes of said coupling members and said column members, whereby said pairs of column members are connected together in both end regions in said side-by-side arrangement, said columns comprising drift holes defined by said notches in the mutually facing narrow sides of opposing column members, said drift holes being arranged inwardly from and in proximity to said clamp connection of said column members;
and interconnecting pieces constituting flat bars for interconnecting respective pairs of said columns, said interconnecting pieces comprising respective neck portions of said flat bars fitting said drift holes, whereby said columns engage and hold said interconnecting pieces.

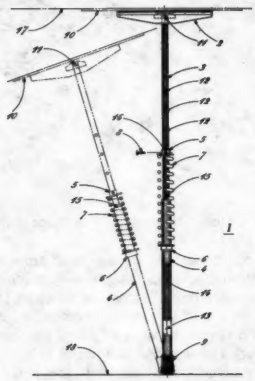
4,576,354

PANEL OVERHEAD SUPPORT APPARATUS

William R. Biessing, Sr., 95 Saddle Mountain Rd., Colorado Springs, Colo. 80919

Filed Jun. 14, 1984, Ser. No. 620,557
Int. Cl.[4] B25J *3/00*
U.S. Cl. 248—354.5 1 Claim

1. An apparatus for supporting workpieces in position during fixed attachment of the workpieces in position, said apparatus comprised of:
a load bearing support plate for flatly engaging and supporting the workpiece in position;
a support rod, said support rod having a circular cross section, having the support plate rotatably attached to the upper end thereof, and having the lower portion thereof disposed in a cavity, for that purpose, in a support barrel and further having a plurality of equally spaced holes for accepting an adjusting pin;
a support barrel, said barrel having a circular cross sectioned interior cavity of sufficient diameter as to closely accept the lower portion of the support rod, said support barrel having a non-slip means attached to the lower end thereof, and further having a means for the fixed attachment of a lower spring retaining clamp at the lower end thereof;
a helical compression spring, said spring having a diameter



sufficient to be disposed around the lower end of the support rod and the upper end of the support barrel;
an upper spring retaining clamp, said upper clamp adjustably attached to the support rod, and having a means to retain the upper end of the spring, and further having a passage of diameter sufficient to allow passage of the adjusting pin;
a lower spring retaining clamp, said lower clamp fixedly attached to the outer diameter of the barrel, and having a flange which supports the lower end of the spring, said upper and lower retaining clamps positioned so as to cooperate with the spring to push the support rod out of the support barrel a distance sufficient to transmit a force through the rod to the support plate so as to hold the workpiece in position, and;
the adjusting pin for fastening the upper clamp in the appropriate hole in the support rod to extend the support rod out of the support barrel to the distance necessary to support the workpiece in position.

4,576,355

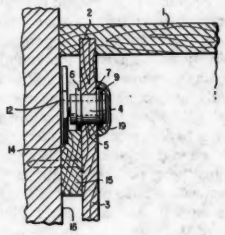
SUSPENSION HARDWARE FOR SUSPENDED CABINETS

Erhard Graf, Überlingen, Fed. Rep. of Germany, assignor to Alno-Möbelwerke GmbH & Co. KG, Pfullendorf, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,227
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331836
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—544 9 Claims

1. In a suspension hardware device for suspending a cabinet having a rear wall from a supporting strip mounted on a building wall in a horizontal orientation and having a recessed configuration, which hardware device includes a hardware

housing member disposed in the rear wall of the cabinet and adjustment means operatively associated with the housing member for an at least two-dimensional adjustment of the housing member with respect to the building wall, the adjustment means including an adjustment screw mounted in the housing member and extending perpendicularly to the plane of the rear wall of the cabinet, with one end of the screw being disposed in the interior of the cabinet and provided with engagement faces for an adjustment tool and the other end of the screw extending behind the rear wall of the cabinet, and a head member fixed to the other end of the screw for engaging behind the supporting strip, the improvement wherein:



the length of said housing member approximately corresponds to the thickness of the rear wall of the cabinet;

said hardware device comprises holding elements associated with said housing member, resting against the front and rear elements of the rear wall, and holding said housing member in a manner to allow said housing member to rotate in the rear wall of the cabinet;

said housing member is provided with a threaded through bore in which said screw threadedly engages; and

said head member is a disc-shaped member provided along its circumference with a plurality of contact faces at different respective distances from the axis of said through bore.

4,576,356

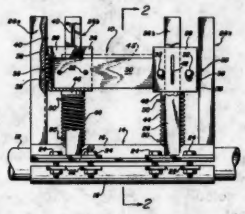
PIPE-VIBRATION REDUCER

Richard J. Kucera, 3861 Balsa St., Irvine, Calif. 92714

Continuation-in-part of Ser. No. 444,540, Feb. 3, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 665,564

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—559 **9 Claims**



1. A frequency-tunable, vibration-reducer device for pipes and the like, comprising:

a mounting bracket defined by a first clamp member and a second clamp member, means for securing said first and second clamp members together wherein said clamp members are adapted to be fixedly secured to a pipe at any desired radial position thereon;

a dynamic mass freely mounted to said first clamp member;

guide means secured to and extending transversely of said first clamp member;

a pair of carriage members slidably received in said guide means, and supporting said dynamic mass within said guide means said entire dynamic mass being linearly moveable along with said carriage members in directions toward and away from said first clamp member;

bearing means interposed between said carriage members and said guide means, whereby said dynamic mass may move freely without restriction;

resilient means interposed between said carriage members and said first clamp member; and

means for securing said resilient means to said carriage members and said first clamp member, whereby the resonant vibration of said pipe is directly transferred through said resilient means and into said dynamic mass, thus allowing said dynamic mass to be located radially outward from said pipe at a selective angular position relative to said pipe.

4,576,357

LEVELING ELEMENT

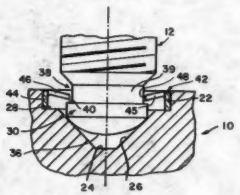
Rudolf Schrepfer, Eigenheimstr. 22, Küsnacht/ZH, Switzerland 8700

Filed Nov. 9, 1983, Ser. No. 550,489

Claims priority, application Switzerland, Feb. 7, 1983, 685/83

Int. Cl.⁴ F16M *3/00*

U.S. Cl. 248—662 **9 Claims**



1. A leveling element comprising a post, a support plate containing an opening defining a seat for receiving the end of the post, bearing means at said end of the post structured to be received in said opening in tangential engagement with the seat, retaining means embodying a flexibly yieldable flange defining an opening bounded by an annular edge centered with respect to said bearing opening and of a smaller diameter than said opening, spaced from the place of tangency of the bearing means with the seat, said flange being rigidly resistant to lateral displacement of the bearing means relative to the seat while permitting angular movement of the bearing means relative to the seat and being resiliently yieldable in a direction toward the seat to expand the opening defined by said edge to a diameter larger than said bearing means to admit the bearing means through the opening therein into tangential engagement with the seat and limitedly yieldable in the opposite direction to contract the opening to a diameter smaller than the diameter of the bearing means to prevent withdrawal of the bearing means through said opening and, hence, disengagement of the bearing means from the seat.

4,576,358

REMOTELY OPERABLE SAFETY VALVE

James D. Mott, Houston, and Danny K. Wolff, Cleveland, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Apr. 20, 1983, Ser. No. 486,909

Int. Cl.⁴ F16K *31/143*

U.S. Cl. 251—14 **16 Claims**

1. An improved remotely operable valve for controlling fluid flow through a rotating tubular member having,

a stationary housing,

a remotely disposed source of pressurized hydraulic fluid,

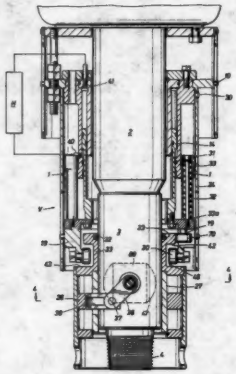
a tubular rotatable housing, having a flow passage formed

therein, which is rotatably mounted with respect to the stationary housing section,

valve means mounted within said rotatable housing for controlling fluid flow through said flow passage by rotation of a valve shaft between an open position for enabling fluid flow and a closed position for blocking fluid flow,

piston means disposed in said stationary housing and operably connected to said source of hydraulic fluid and connected to a bearing means,

an actuating assembly means having a bearing contact surface, said actuating assembly means for operably connecting said stationary housing to said valve shaft in order to open or close the valve means, said actuating assembly means being rotatable with said rotatable housing and mounted for axial movement with respect to said rotatable



housing to control said valve, said bearing means connected to said piston means rotatably contacting said bearing contact surface of said actuating assembly means for axially operably moving the actuating assembly,

the valve being remotely operable to permit opening or closing of the flow path while enabling relative rotation between the rotatable housing and the stationary housing, wherein the improvement comprises,

means for removing said source of pressurized fluid on said piston means after said valve has been opened, and

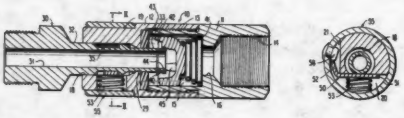
means for automatically preventing contact between the bearing contact surface of the rotating actuating assembly means and the bearing means when the valve is in the open position and said source of pressurized fluid has been removed from said piston means.

4,576,359

COUPLING FOR PRESSURE GAS LINES

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen, Switzerland

Filed Mar. 15, 1984, Ser. No. 589,702
Int. Cl.[4] F16L *37/28*
U.S. Cl. 251—149.6 **14 Claims**



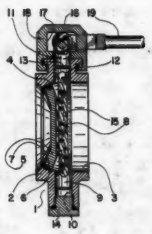
1. A coupling for a pressure gas line, comprising a sleeve-like first means intended to receive gas under pressure at one end thereof and including spring-loaded valve means for normally closing off said one end with respect to a bore leading to the other end of said first means, a tubularly shaped second means for conducting-on the gas under pressure, said tubularly shaped second means being provided with an annular groove, and further means for detachably connecting said first and second means with each other by inserting said tubularly shaped second means into the bore of said sleeve-like first means while at the same time opening said valve means to thereby establish a through-flow path for gas under pressure from the one end of the sleeve-like first means by way of the now-opened valve means into the interior of said tubularly shaped second means, said further means including a latching means operable to engage in the annular groove provided in said second means, said latching means being formed by a plate-like member operable to be guided in a cut-out provided in the part of said sleeve-like first means containing said bore and extending from the outside of said part to said bore substantially transversely to the axis of the coupling, a ring-like member rotatable on said part of the sleeve-like first means and having an inwardly projecting actuating means for engagement with said plate-like member to displace the same upon rotation of said ring-like member in its disengaging direction, and a spring between said ring-like member and said plate-like member for urging the plate-like member into its engaging position, characterized in that said part of the sleeve-like first means has a reduced diametric dimension relative to the diametric dimension of the section of the sleeve-like first means containing said valve means, and in that said plate-like member has a first substantially flat main portion in engagement with said spring and operable to engage in said annular groove and a second shorter leg portion bent at such obtuse angle to said flat main portion as to extend generally in the direction toward said inwardly projecting actuating means whereby the external diametric dimension of said ring-like member can be kept relatively small.

4,576,360

FLOATING DISC BUTTERFLY VALVES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 413,531, Aug. 31, 1982, Pat. No. 4,520,995. This application Dec. 24, 1984, Ser. No. 685,753
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—162 **6 Claims**



1. A floating disc valve comprising in combination:

(a) a valve body including a fluid passage having an inner surface including an annular seat disposed on a plane substantially perpendicular to the central axis of said fluid passage wherein said annular seat substantially coincides with a hypothetical spherical surface with the center substantially located on the central axis of said fluid passage;

(b) a stem with the central axis substantially passing through the center of said hypothetical spherical surface and intersecting the central axis of said fluid passage in a substantially perpendicular angle, said stem including two sets of rack teeth respectively disposed on two opposite sides of said stem intermediate two extremities of said stem wherein said rack teeth are disposed in an oblique angle with respect to the central axis of said stem, said stem

rotatably and slidably supported at two extremities by said valve body wherein at least one extremity of said stem extends through said valve body rotatably and slidably in a leak-proof manner; and

(c) a disc pivotably disposed within said fluid passage adjacent to said annular seat having a rim substantially conforming to said annular seat when said disc is rotated to the fully closed position, said disc slidably connected to said stem by means of said two sets of rack teeth included in said stem slidably engaging two sets of rack teeth disposed on one side of said disc wherein said disc rack teeth are disposed in an oblique angle with respect to the plane including the rim of said disc, wherein the only possible movement of said disc relative to said stem is a sliding movement on a plane substantially including the central axis of said disc and the central axis of said stem;

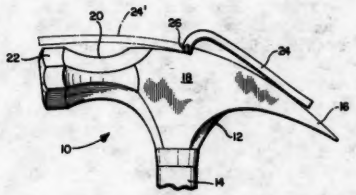
whereby, a small amount of axial movement of said stem in one direction relieves the seating pressure between said annular seat and the rim of said disc and a small amount of axial movement of said stem in the other direction opposite to said one direction establishes said seating pressure.

4,576,361

CLAW HAMMER WITH PROTECTIVE CUSHION

Alan C. Knight, 243 E. 18th Ave., Columbus, Ohio 43201

Filed Feb. 27, 1981, Ser. No. 238,906
Int. Cl.⁴ B66F *15/00*
U.S. Cl. 254—26 R **6 Claims**



1. A claw hammer having a handle and a hammer head with a claw end and a bell end, said hammer having permanently attached thereto a protective cushion which during nail driving is in a resting position which will not interfere with nail driving but at least a portion of which is readily movable into a working position over said bell end whereby damage to the nail bearing surface is prevented or minimized when said claw end is used for nail pulling and which is retractable from said working position to said resting position, and wherein said protective cushion has a means to pivot at least a portion of said protective cushion to move it into the working position over said bell end.

4,576,362

METHOD FOR PULLING LONG RUNS OF FIBER OPTIC CABLE

Ralph C. Langston, 13588 SE. 152nd Ave., Clackamas, Oreg. 97015

Filed Sep. 7, 1984, Ser. No. 648,757
Int. Cl.⁴ H02G *1/08*
U.S. Cl. 254—134.3 FT **13 Claims**

1. A method for pulling a long run of fiber optic cable through an underground conduit having an entry at one end and an exit at an opposite end, the method comprising:

providing at least one intermediate access point spaced between the entrance and exit to divide the length of the conduit into segments each having a length such that a pulling tension applied to the cable sufficient to pull the cable through each conduit segment is less than a predetermined tension at which the fiber optic cable could be damaged;

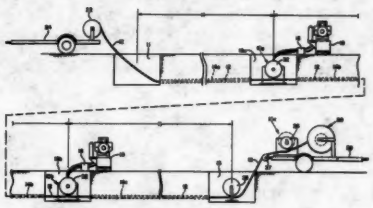
placing a continuous long run of fiber optic cable at the conduit entry;

placing at each intermediate access point a first pulling means and at the conduit exit a second pulling means, for pulling the cable through each segment of the conduit;

extending a pull rope from the conduit entry through the conduit via each intermediate access point to the conduit exit;

connecting a lead end of the pull rope to the fiber optic cable and an opposite end thereof to the second pulling means and engaging an intermediate portion thereof with the first pulling means;

engaging the first pulling means in gripping contact with the cable for applying an upstream pulling tension to a portion of the cable upstream from the first pulling means;



simultaneously driving each pulling means to pull the rope and the cable through the conduit;

controlling each of the first and second pulling means to pull the cable at a predetermined pulling speed and to limit the upstream pulling tension on the portion of the cable upstream from each pulling means so as not to exceed a predetermined tension through each conduit segment from the conduit entry to the conduit exit but sufficient to provide a positive downstream tension in a downstream portion of the cable adjacent each first pulling means, and;

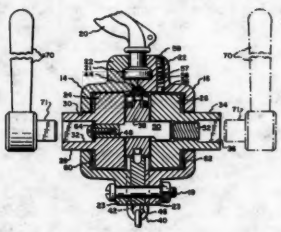
responsive to a slackening of the downstream tension in the downstream portion of the cable, temporarily disengaging the first pulling means from said gripping contact with the cable so as to interrupt applying said upstream pulling tension to the portion of cable upstream therefrom until the downstream pulling tension is restored.

4,576,363

LEVER-OPERATED HOIST OR PULLER

James J. Pancook, Tonawanda, N.Y., assignor to Columbus McKinnon Corporation, Amherst, N.Y.

Filed May 15, 1985, Ser. No. 734,159
Int. Cl.⁴ B66D *1/30, 1/48, 3/12, 5/22*
U.S. Cl. 254—372 **10 Claims**



1. A lever-operated type chain hoist or load puller comprising a housing having a support hook extending therefrom and a drive shaft rotatably mounted in said housing and carrying a load engaging sprocket wheel thereon and a load chain passing in and out of said housing and training over said sprocket

wheel for load hoisting and lowering and/or pulling in response to reverse rotations of said shaft, the improvement comprising:

said housing being composed of a pair of oppositely facing half shell members having means locking them together at upper and lower opposite flange portions thereof and defining interiorly thereof a cylindrical chamber with said drive shaft and sprocket wheel being disposed centrally therein;

a pair of rollers disposed within said chamber at opposite sides of said sprocket wheel, said rollers having hub portions extending in rotatable relation through apertured end wall portions of said shell members, and washer-shaped friction discs encompassing said hub members interiorly of said chamber and being thereby positioned between outside surfaces of said rollers and inside end surfaces of said housing shell members;

one of said rollers being keyed to one end of said drive shaft, and the other of said rollers being screw-threaded upon the other end of said drive shaft;

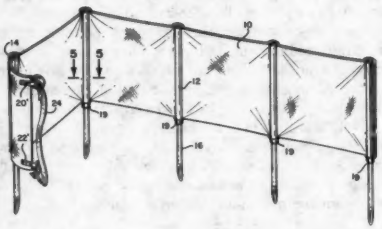
the outer extending end portions of said hubs being shaped to accommodate detachable engagements therewith externally of said housing by means of a wrench type lever or the like.

4,576,364

PORTABLE WIND SCREEN

Patrick J. O'Fearna, 12449 Short Ave., Los Angeles, Calif. 90066

Filed Feb. 29, 1984, Ser. No. 584,853
Int. Cl.⁴ E04H *17/16*
U.S. Cl. 256—24 **6 Claims**



1. A portable beach screen comprised of a rectangular sheet of fabric, a plurality of hollow poles disposed parallel to each other along the length of the sheet, each pole being placed against said sheet, a plurality of C clamps, at least one clamp placed over each pole with said sheet clamped therebetween, a plurality of stakes, a separate stake telescoped within each pole, each stake having a point at one end and resilient sleeve near the end thereof remote from said point, said sleeve being of sufficient thickness to be compressed between said stake and the hollow pole into which said stake is inserted.

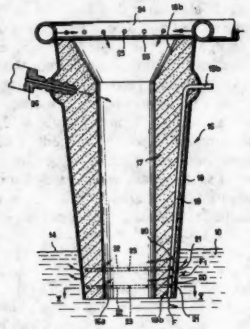
4,576,365

DEVICE FOR THE REMOVAL OF INCLUSIONS CONTAINED IN MOLTEN METALS

Jean-Charles Daussan, Metz; André Daussan, Longeville les Metz, and Gérard Daussan, Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Division of Ser. No. 438,491, Nov. 2, 1982, Pat. No. 4,468,012. This application Apr. 27, 1984, Ser. No. 604,602
Claims priority, application France, Nov. 13, 1981, 8121229
Int. Cl.⁴ C21C *5/48*
U.S. Cl. 266—220 **2 Claims**

1. A device for removing inclusions from molten metal, in which the molten metal is poured into a casting tundish through a casting tube immersed in the molten metal contained in said tundish, said casting tube being provided internally with a lining of heat-insulating material, which is sinterable at the temperature of the molten metal poured into said casting tube and becomes porous after sintering, wherein said casting tube comprises a pipe embedded in the sinterable heat-insulating lining, one end of said pipe being adapted to be connected to an inert gas supply and being located at the upper portion of said tube and the other end of the pipe having a gas outlet at the lower end of the casting tube in contact with the molten metal



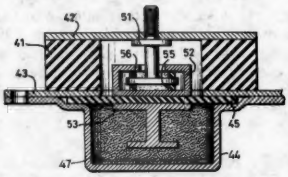
which is poured into the casting tundish, the pipe adjacent said other end having at least one gas outlet orifice (20) in contact with the sinterable heat-insulating lining, the pores formed in the lining after sintering enabling gas to flow from said orifice to the external surface of said lining, and a protective casing externally surrounding said sinterable heat-insulating lining, said casing having openings located opposite the orifices of the inner gas feed pipe.

4,576,366

ANTIVIBRATION ELASTIC SUPPORT

Gérard Gallas; Loic Raher, and Bernard Renzo, all of Nantes, France, assignors to Compagnie des Produits Industriels de l'Quest (C.P.I.O), Nantes Cedex, France

Filed Sep. 28, 1983, Ser. No. 536,649
Claims priority, application France, Sep. 28, 1982, 82 16279
Int. Cl.⁴ B60G *13/00*; F16F *9/30*
U.S. Cl. 267—8 R **2 Claims**



1. An antivibration elastic support comprising:

a first and second reinforcement member;

an elastomeric unit interconnecting said first and second reinforcement member and having a first fluid tight chamber formed therein;

a movable member connected to said first reinforcement member and including a base;

a housing connected to said second reinforcement member and forming a second fluid tight chamber, said second fluid tight chamber having a damping material positioned therein;

a container within which said base of said movable member is positioned;

a piston located within said housing;

an elastomeric element secured between said housing and said second reinforcement member wherein said elastomeric element further interconnects said container and said piston; and

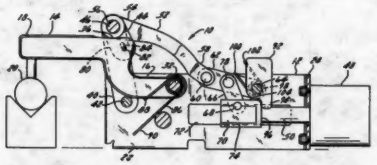
at least one elastomer member positioned between said base of said movable member and an inner wall of said container.

4,576,367

PNEUMATIC MECHANICAL CLAMP INCLUDING LOCKING MEANS

Edward R. Horn, Germantown, and Norbert J. Kot, II, Milwaukee, both of Wis., assignors to Aladdin Engineering & Mfg. Co., Brookfield, Wis.

Filed Jan. 2, 1985, Ser. No. 688,189
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—32 13 Claims



1. A mechanical clamp for use in clampingly engaging a workpiece, the mechanical clamp comprising:

a frame,

a clamp member having an end portion supported for movement toward and away from a supporting surface and adapted to clampingly engage a workpiece against the supporting surface, said clamp member including a cam surface,

means for pivotally connecting said clamp member to the frame such that the clamp member is pivotally movable between a clamping position wherein the end portion of the clamp member clampingly engages the workpiece against the supporting surface and a release position wherein the end portion releases the workpiece,

means for selectively forcing said end portion of said clamp member into clamping engagement with the workpiece, said means for selectively forcing including a force applying member engageable with said cam surface,

a first toggle lever having opposite ends, one of said opposite ends being pivotally connected to said force applying member, a second toggle lever having opposite ends, one of said second toggle lever opposite ends being pivotally connected to said frame and the other of said second toggle member opposite ends being pivotally connected to the other of said opposite ends of said first toggle lever, and a third toggle lever having opposite ends, one of said third toggle lever opposite ends being pivotally connected to said second toggle lever intermediate its opposite ends, and the other of said third toggle lever opposite ends being pivotally connected to a piston for reciprocal movement with said piston between an extended position wherein said clamp member is in said clamping position and a retracted position wherein said clamp member is in said release position, and

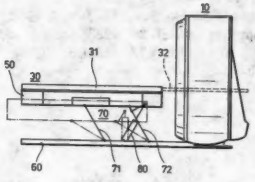
means for releaseably locking said third toggle lever in said extended position.

4,576,368

TABLE MECHANISM

Yoshiyuki Ogawa; Hideaki Uno, and Misao Baba, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Toyko, Japan

Filed Mar. 7, 1984, Ser. No. 587,138
Claims priority, application Japan, Dec. 9, 1983, 58-233317
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—322 8 Claims



6. A table mechanism usuable in medical diagnostic systems, said table mechanism comprising

a table resting on a floor and comprising a table top, and a cradle movably mounted on said table top, said cradle having space for holding a patient longitudinally thereon, and wherein at one longitudinal end of said table is defined a work space, both said table top and said cradle being movable into said work space;

table top lifting means for concurrently moving said table top vertically and horizontally while maintaining said table top parallel to said floor, said moving of said table top being from a rest position near said floor and most distant from said work space to a work position different from said rest position and closest to and into said work space;

cradle moving means for moving said cradle from a rest position on said table top to a position extended from said table top and into said work space;

wherein said table top lifing means comprises a parallel link mechanism and a driving mechanism, said driving mechanism being expandable and contractable to drive said parallel link mechanism to cause concurrent vertical and horizontal movement of said table top while maintaining said table top parallel to said floor;

wherein said parallel link mechanism comprises a plurality of links of substantially the same length and spaced parallel to each other at a predetermined distance from each other, one end of each link being rotatably connected to said table to be angularly movable relative to said table without any lateral movement relative to said table, another end of each link being rotatably connected to said floor to be angularly movable relative to said floor without any lateral movement relative to said floor;

wherein said driving mechanism has one end pivotally connected to a portion of said parallel link mechanism and another end pivotally connected to said floor, whereby said driving mechanism fully contracts to move said links of said parallel link mechanism downwardly to a position closest to said floor and consequently moves said table top to said rest position most distant from said work space, and fully expands to move said one ends of said links of said parallel link mechanism upwardly to a position away from said floor, and consequently moves said table top to said work position closest to and into said work space; and

wherein said cradle moving means comprises an angle detecting means for detecting the angle of said links of said parallel link mechanism with respect to said floor and for providing an output signal indicative of said angle; a control means responsive to said output signal for calculating the distance travelled by said cradle from said rest position on said table top and for providing a distance signal indicative of said travelled distance; and adjusting means re-

sponsive to said distance signal for adjusting the distance travelled by said cradle.

4,576,369

METHOD IN PRODUCING STITCHED PRINTED MATTERS AND FEEDER FOR WORKING THE METHOD

Carl G. A. Flensburg, Per Albin Hanssons väg 52B, S-214 63 Malmö, and Rolf H. V. Isaksson, Diakongatan 59, S-216 23 Malmö, both of Sweden

Continuation of Ser. No. 386,515, Jun. 9, 1982, abandoned. This application Jul. 29, 1983, Ser. No. 517,993

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 7 Claims

1. A method for producing stitched printed matters comprising the steps of laying signatures on a saddle at a plurality of spaced apart stations arranged along a conveyor path, advancing said signatures along said conveyor path between and through said stations wherein at least some of said signatures are being laid one upon the other as said signatures are advanced through said stations, cyclically increasing and decreasing the speed of said advancing of said signatures along said conveyor path between a first lower speed and a second higher speed, said signatures being advanced through said stations at said first lower speed and between said stations at said second higher speed, and stapling and trimming said signatures laid one upon the other as said signatures are continuously advanced along said conveyor path.

6. An apparatus for producing stitched printed matters, said apparatus comprising a saddle conveyor for advancing signatures having a back there along, means for cyclically increasing and decreasing the speed of said conveyor between a first lower speed and a second higher speed, and a plurality of signature feeders arranged along said conveyor for laying signatures thereon, said signatures being advanced past said feeders at said first lower speed and between said feeders at said second higher speed, each of said feeders including a magazine for storage of said signatures, rotative gripping means for gripping one at a time said signatures in said magazine at the back thereof and for withdrawing said signatures therefrom, a fixed abutment for engagement with the withdrawn signatures, and a pair of rotative gripping members, one of said rotative gripping members arranged coaxial with said rotative gripping means and located adjacent one side thereof and the other of said rotative gripping members positioned radially outside said rotative gripping means, said rotative gripping members gripping opposite sides of said signatures in engagement with said fixed abutment for separating said signatures while laying said signatures astride said conveyor.

4,576,370

METHOD AND APPARATUS FOR TIPPING CLOSELY INCIDENTAL MAIL TO MAGAZINES OR THE LIKE

Dale H. Jackson, Plattsburgh, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Dec. 24, 1984, Ser. No. 685,712

Int. Cl.[4] B65H *39/02*

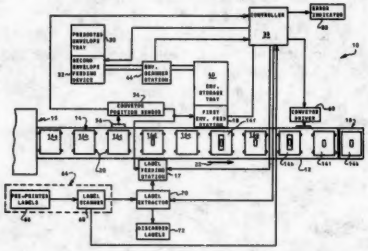
U.S. Cl. 270—54 17 Claims

1. A method for automatically tipping mail pieces to certain magazines sequentially fed from a first location to a second location, said method comprising the steps of:

(a) sorting said mail pieces into groups according to geographic regions, each mail piece having machine readable geographic information thereon;

(b) sorting subscriber labelling information into groups according to geographic regions, said subscriber labelling information including machine readable geographic information and mail piece attachment indicia indicating whether a subscriber is to receive a mail piece;

(c) machine scanning subscriber labelling information corresponding to each magazine fed from the first location to the second location;



(d) generating a signal in response to the scanning mail piece attachment indicia indicating the subscriber is to receive a mail piece on the subscriber labelling information;

(e) automatically transferring at least some of said subscriber labelling information to selected some of said magazines feeding from the first location to the second location in response to said signal;

(f) automatically actuating tipping means for attaching mail pieces to selected others of said magazines fed from the first location to the second location in response to said signal.

4,576,371

SORTER HAVING GUIDE MEMBERS

Koji Takahashi, and Akira Mochizuki, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,974

Claims priority, application Japan, May 31, 1982, 57-92413

Int. Cl.[4] B65H *39/10*

U.S. Cl. 271—296 7 Claims

1. A sorter for sorting copy sheets made from an original by a copying machine, comprising:

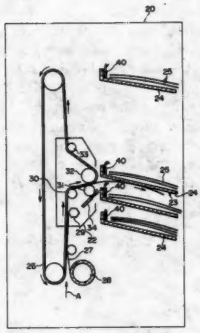
a plurality of trays vertically arranged in multiple stages at predetermined intervals;

a vertically movable indexer for delivering copy sheets to predetermined trays, said indexer including means for upwardly curving said copy sheets as said copy sheets are delivered into said predetermined trays so that ends of said upwardly curved copy sheets curve downwardly with respect to a bottom surface of said trays;

a conveyor for conveying said copy sheets to said indexer; and

a flexible guide member provided at an inlet portion of a first tray for guiding a copy sheet discharged from said indexer

into said first tray along a bottom surface of a second tray located above said first tray, said flexible guide member being capable of yielding under force of contact with one of said copy sheets.

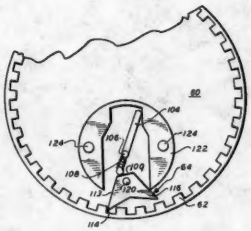


4,576,372

TURNTABLE EXERCISE MACHINE

Michael Rinaldi, 193 Norwood Ave., Lodi, N.J. 07644

Filed Nov. 29, 1984, Ser. No. 676,489
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—146 **13 Claims**



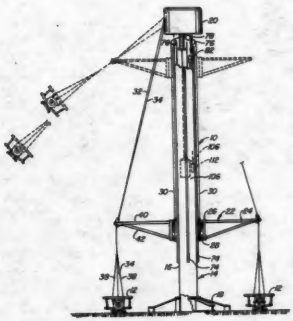
1. A turntable exercise machine; comprising:
(a) machine body means;
(b) pressure plate means rotatively carried by said machine body means;
(c) top plate means rotatively carried by said pressure plate means; and
(d) ratchet means disposed between said pressure plate means and said top plate means and coacting with said pressure plate means and top plate means to effect concurrent rotation of said top plate means and said pressure plate means upon rotation of said top plate means in a first predetermined direction, and rotation of said top plate means and not said pressure plate means upon rotation of said top plate means in a second predetermined direction.

4,576,373

AERIAL AMUSEMENT RIDE

Robert Spieldiener, Im Winkel #13, FL 9496 Balziers, Liechtenstein; Alfons Saiko, Speerstrasse 26 A, 8942 Oberrieden, and Reinhold Spieldiener, Aussichtssrasse 23, 8704 Herrliberg, both of Switzerland

Filed Oct. 24, 1983, Ser. No. 544,634
Int. Cl.[4] A63G *1/28*
U.S. Cl. 272—41 **12 Claims**



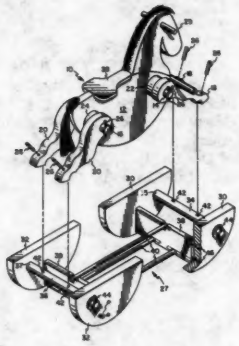
1. An aerial amusement ride comprising:
(a) a central tower;
(b) a plurality of passenger vehicles;
(c) an outrigger structure having coupling means for coupling said outrigger structure to said tower, wherein said outrigger structure is both rotatable about said tower and vertically displaceable on said tower, said outrigger structure having the same number of boom members as said plurlity of vehicles;
(d) first drive means on said tower for vertically displacing said outrigger structure on said tower;
(e) second drive means associated with said coupling means for rotating said outrigger structure about said tower concurrently with the raising and lowering of said outrigger structure;
(f) cable means having vehicle suspension cables connected to said vehicles for suspending said passenger vehicles and,
(g) which means mounted on a support structure rotatably coupled to said tower for reeling said cables and displacing said suspended vehicles, wherein said outrigger structure has cable tracking means on the distal ends of said boom members over which said cables are guided, said winch support structure being rotated by third drive means on said tower in unison with said outrigger structure with the rotating and displacing of said outrigger structure being coordinated with reeling said vehicles in and out for a desired ride pattern.

4,576,374

ROCKING HORSE WITH INTERCONNECTED ROCKERS

Gary M. Thomas, 1513 Bob Smith, El Paso, Tex. 79936

Filed Aug. 17, 1984, Ser. No. 641,700
Int. Cl.[4] A63G *13/06*
U.S. Cl. 272—57.5 5 Claims



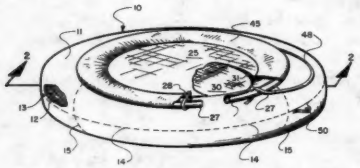
1. A rocking toy comprising:
a body portion for supporting a rider,
front leg means fixedly connected to said body portion,
rear leg means rotatably connected to said body portion,
rocker means including
a first circular shaped rocker member rotatably connected with said front leg means eccentric and relatively forward of the center of rotation of said first rocker member,
a second circular shaped rocker member rotatably connected with said rear leg means eccentric and relatively rearward of the center of rotation of said second rocker member, and
tie rod means connecting said first and second rocker members for synchronizing rotation of said first and second rocker members during movement of said rider,
said tie rod means including at least two parallel tie rods each pivotally mounted a different distance along a radius of said first rocker member and pivotally connected the same different distance along a corresponding parallel radius of said second rocker member on the same side of said centers of rotation,
said at least two parallel tie rods having opposed relative motion with respect to one another for said synchronizing rotation.

4,576,375

FLOTATION TRAMPOLINE

Donald K. Roberts, 488 W. 2000 South Building 4, Orem, Utah 84057

Filed Jan. 30, 1984, Ser. No. 575,464
Int. Cl.[4] A63B *5/00*; A63G *31/00*
U.S. Cl. 272—65 11 Claims



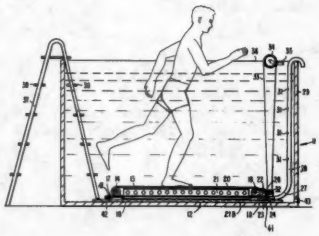
1. A flotation trampoline adapted for use on a body of water, comprising:
a non-elastic, collapsible encasement having a symmetrical configuration resembling an innertube when fully expanded and which includes a lower, interior tube surface commencing at the innermost perimeter of the tube opening and continuing downward to a second perimeter occuring on the lower tube surface at the innermost locus of contacts which would occur with water when the fully inflated tube is positioned on a still water surface, said tube having a diameter of at least three feet;
inflatable support means contained within the encasement and adapted with means for receiving air therein to expand and support the collapsible encasement;
a base cover attached and sealed at a perimeter on the lower, interior tube surface to seal off rapid air flow through the tube opening to the base of the tube to thereby create a substantially closed volume between the base cover, lower interior tube surface and a water surface upon which the tube is placed; and
a resilient, trampoline mat positioned over the tube opening near the top of the tube encasement and attached to the encasement and displayed above said base cover thereby defining a second closed volume for use as a trampoline jumping surface.

4,576,376

EXERCISING APPARATUS

Paul H. Miller, 8 Pheasant Run Dr., Batesville, Ind. 47006

Filed Nov. 23, 1984, Ser. No. 674,184
Int. Cl.[4] A63B *23/06*
U.S. Cl. 272—69 8 Claims



1. An exercising apparatus comprising an open topped tank of sufficient size for entry of an individual to exercise therein:
a treadmill located in said tank;
a pump coupled to said treadmill and operable by said treadmill to pump a fluid in said tank in response to operation of the treadmill by an individual exercising in the tank.

4,576,377

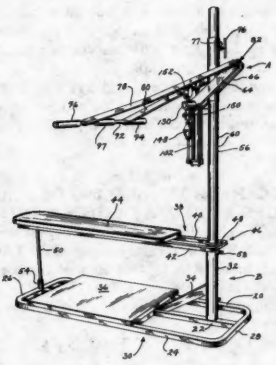
ATHLETIC EXERCISER ASSEMBLY

Leslie C. Wolff, Box 188, Lakeview Dr., Hackensack, Minn. 56452

Continuation of Ser. No. 554,820, Nov. 23, 1983, abandoned.
This application Aug. 15, 1985, Ser. No. 765,717
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 8 Claims

1. Athletic exercise apparatus comprising a ground-supported base and a stationary upstanding post carried by and extending upwardly from said base with the base being mainly on an exercise side of said post, an exercise arm supported by and having a pivotal connection with respect to said post with the axis of the pivot of the pivotal connection being horizontal whereby the arm can be swung by the user of the apparatus toward and away from the main portion of the base, said pivot being spaced horizontally from said post in the direction opposite from said main portion of said base, and a hydraulic piston-cylinder assembly extending substantially parallel with said post and having pivotal connections with said arm and said post and spaced from said post on the side of the post above

said main portion of said base with the connection of the piston-cylinder assembly with said arm traversing from a position at a level higher than said pivot to a position at a level lower than said pivot and with the mid-point of travel of said connection of said piston-cylinder assembly and arm being about at



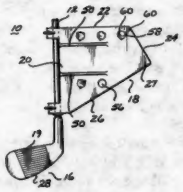
the same level as said pivot as the piston moves longitudinally in said cylinder from one end of the cylinder to the other for restraining the swinging movement of said arm about said pivot so that force can be put manually on said arm to move it against the hydraulic action of said piston-cylinder assembly to thereby exercise the user of the apparatus.

4,576,378

GOLF PRONATION TRAINING DEVICE

George S. Backus, 745 Hillrise Pl. NE., Bremerton, Wash. 98310

Filed Jun. 13, 1984, Ser. No. 620,036
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **12 Claims**



1. In combination with a golf club, a lightweight training device, comprising:

(a) a lightweight, thin, substantially planar, singular airfoil portion;

(b) a first, elongated, marginal side edge portion extending along one side edge of said singular airfoil portion, said side edge portion being substantially thicker than the thickness of said singular airfoil portion; and,

(c) means for detachably attaching said first side edge portion to the shaft of the golf club to:

dispose said first side edge portion longitudinally adjacent the length of the golf club shaft; and,

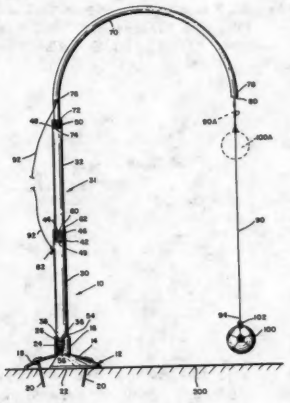
adjustably, angularly orientate said airfoil portion about the longitudinal axis of the golf club shaft alternatively between a first variable position wherein said airfoil portion extends in a selective orientation about the longitudinal axis of the golf club shaft generally in a direction opposite to and parallel to the face of the head of the golf club and a second variable position wherein said airfoil portion extends in a selective orientation about the longitudinal axis of the golf club shaft generally in the same direction as and parallel to the face of the head of the golf club thereby to selectively alter the magnitude and the direction of the torque load that is applied to the club shaft during the swinging of the club.

4,576,379

SOCCER PRACTICE APPARATUS

Istvan Juhasz, 6578 Bell Bluff Ave., San Diego, Calif. 92119

Filed Apr. 26, 1984, Ser. No. 604,372
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—411 **2 Claims**



1. A soccer practice apparatus comprising:

a. a generally vertically disposed support member which is supported at ground level at its lowermost end;

b. said generally vertically disposed support member further comprising a multiplicity of sections which are interconnected at adjoining ends;

c. said generally vertically disposed support member being supported at its lowermost end by a base which is removably secured to the ground;

d. a continuously curved arcuate hollow member having its rear end supported at the opposite end of said generally vertically disposed support member;

e. said continuously curved arcuate hollow member further comprising a multiplicity of interconnected sections;

f. the front end of said continuously curved arcuate hollow member extending away from said generally vertically disposed support member;

g. the front end of said continuously curved arcuate hollow member being open and extending generally toward the ground;

h. a ball height adjustment means supported through said continuously curved arcuate hollow member and having its front end extending through the opening at the front end of said continuously curved arcuate hollow member;

i. the front tip of said ball height adjustment means being secured to a soccer ball;

j. the rear portion of said ball height adjustment means extending through an opening in the surface of said hollow arcuate member and being secured to a location on said generally vertically disposed support member at any multiplciity of locations along the length of said ball height adjustment means; and

k. said continuously curved arcuate hollow member extending for a horizontal arc length of at least 110 centimeters;

l. whereby the height at which said ball is extended above the ground can be adjusted by varying the location along

the length of said ball height adjustment means where it is secured to said vertically disposed support member, said soccer ball is permitted to hang freely in the air at any multiplicity of locations above the ground, and said soccer ball is suspended at a sufficient horizontal distance from said vertically disposed support member to permit a user to safely kick said soccer ball with the foot or hit said soccer ball with his head or chest without incurring a risk of accidentally hitting said vertically disposed support member.

4,576,380

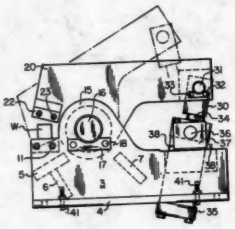
CAST METAL BREAKER APPARATUS

D. Leet Shields, P.O. Box 125, Edgeworth, Pa. 15056

Filed Apr. 12, 1984, Ser. No. 599,662

Int. Cl.[4] B23P *17/02*

U.S. Cl. 225—104 **12 Claims**



1. Breaker apparatus having a fixed base including a bottom plate and spaced substantially parallel side members having their lower edges attached to said bottom plate, a fixed king pin extending between and supported by said side members, a breaker arm rotatably mounted on said fixed king pin, a hydraulic cylinder located between said side members, means on each of said side members pivotally mounting said hydraulic cylinder on said side members, a shear lug welded to each of said side members at the forward end and the rear end of each of said means pivotally mounting said hydraulic cylinder on said side members to prevent chatter of said means pivotally mounting said hydraulic cylinder on said side members when said hydraulic cylinder rotates about said means pivotally mounting said hydraulic cylinder, a rod extending from said cylinder and pivotally connected to the rear end of said breaker arm and a knife at the forward end of said breaker arm, whereby extension of said rod from said cylinder pivots said breaker arm about said fixed king pin to rotate said knife in a downward arc to contact a metal piece extending between the forward upper corners of said side members to break the metal piece.

4,576,381

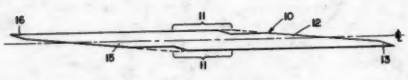
SPIRAL PISTON RING WITH TAPERED ENDS AND RECESSES

Don S. Slack, Mill Valley, Calif., assignor to Rix Industries, Emeryville, Calif.

Filed Nov. 23, 1984, Ser. No. 674,297

Int. Cl.[4] F16J *9/04, 9/14*

U.S. Cl. 277—1 **4 Claims**



1. A spiral piston ring comprising:

a cylindrical spiral of continuous, elastic, self-lubricating material having a rectangular cross section,

said spiral having end portions tapered around at least 90° of the angle of rotation of said cylinder, said end portions being tapered at a very acute angle to a plane perpendicular to the axis of rotation of said cylinder,

each tapered end portion having a tapered terminal portion with the terminal portion being tapered at a less acute angle than said end portion taper with respect to said plane perpendicular to the axis of rotation,

a recess in a convolution adjacent said terminal portion positioned to receive said terminal portion and having the exact size and shape to receive said terminal portion.

4,576,382

PROTECTIVE CAP FOR THE SEALING OF A BUSHING AROUND A PIN IN A CARDAN JOINT

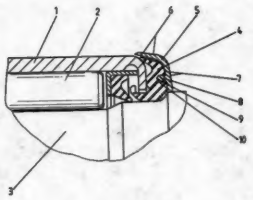
Günter Scharting, Gochsheim, and Steffen Neugebauer, Hesselbach, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,413

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428389

Int. Cl.[4] F16J *15/24;* F16C *33/76*

U.S. Cl. 277—12 **9 Claims**



1. A protective cap for a packing for a bushing, which comprises an outer bushing carrying an outer race, an inner race inside and spaced away from the outer race for defining a free space between the races; a protective packing of generally elastic material for covering and filling the free space between the outer bushing and the inner race; the packing being at the axial end of the bushing; a plurality of rollers disposed in the free space and rollingly contacting the outer race of the bushing and the inner race;

the cap having a radial section extending radially inward over the packing and having an axial section extending axially down along the packing toward the bushing;

one of the packing and the cap having a groove defined therein on the radially extending section thereof and the other of the packing and the cap having a rib defined thereon placed thereon for engaging into the groove, for holding the cap to the packing.

4,576,383

RING SEAL WITH OVERLAPPING FLANGES FOR CONTAMINANT TRAPPING

Michael J. Ballard, P.O. Box 73915, Baton Rouge, La. 70897

Continuation-in-part of Ser. No. 575,709, Jan. 31, 1984, Pat. No. 4,484,754. This application Nov. 26, 1984, Ser. No. 674,563

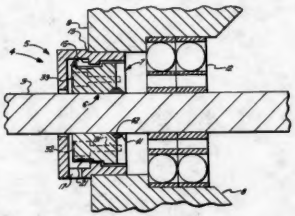
Int. Cl.[4] F16J *15/447*

U.S. Cl. 277—53 **22 Claims**

1. A ring seal between a housing and a rotatable shaft, comprising:

(a) a first ring member generally concentric with a rotatable shaft and fixedly and sealingly attachable to a housing between said housing and said shaft, said first member having an outer annular surface facing externally of said housing and an inner annular surface facing internally of

said housing; an annular recess in said inner surface, forming an outer first annular flange axially adjacent to said housing and an inner second annular flange axially adjacent to said shaft; an annular third flange extending perpendicular to and radially inward from said first flange partially into said recess, forming an annular channel; and an opening from said channel to the exterior of said first member; and



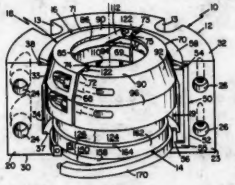
(b) a second ring member generally concentric with said shaft, being fixedly and sealingly attachable to said shaft, and having an outer annular surface facing said inner surface of said first member and an inner annular surface facing internally of said housing; and an annular flange extending axially from said outer surface of said second member and extending into said recess in said first member between said second and third flanges of said first member.

4,576,384

SPLIT MECHANICAL FACE SEAL

Henri V. Azibert, Stoneham, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.

Filed Jan. 3, 1985, Ser. No. 688,659
Int. Cl.⁴ F16J *15/38*
U.S. Cl. 277—81 S **19 Claims**



1. A split mechanical face seal comprising:

a pair of seal ring assemblies, each said ring assembly comprising a rigid seal ring of split ring segments and securing means extending about the outer circumference of each said ring holding said segments thereof together;

said rings each having a flat radially extending sealing surface, the sealing surfaces of said rings being in sealing contact with each other; characterized in that

said rings are axially non-rigidly supported in said seal by resilient support means resiliently contacting and supporting each said ring axially on a side opposite the sealing surface thereof; and

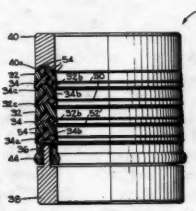
at least one of said support means comprises biasing means axially biasing said rings and said sealing surfaces thereof together.

4,576,385

FLUID PACKING ASSEMBLY WITH ALTERNATING DIVERSE SEAL RING ELEMENTS

Tep Ungchusri, The Woodlands, and William J. Jakubowski, Houston, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 680,070, Dec. 12, 1984, Pat. No. 4,527,806. This application Jul. 9, 1985, Ser. No. 753,296
Int. Cl.⁴ F16J *15/18*
U.S. Cl. 277—124 **7 Claims**



1. A fluid packing assembly in the form of a stacked array for statically and dynamically sealing a cylindrical element to a surrounding cylindrical surface, said assembly comprising:

(a) at least one seal ring element having a generally V-shaped cross-sectional configuration;

(b) at least one backup/energizing ring in supportive relationship with the seal ring element, said backup/energizing ring having a generally Y-shaped cross-sectional configuration;

(c) a spring-energized lip seal ring adjacent the backup/energizing ring, said lip seal ring including a central base and a pair of sealing lips extending therefrom whereby the lip seal ring has a generally U-shaped cross-sectional configuration; and

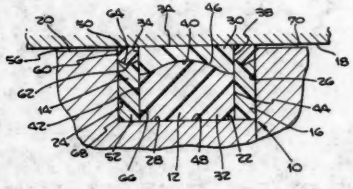
(d) an adapter ring having a generally T-shaped cross-sectional configuration and extending into a supportive relationship with the lip seal ring to prevent dislocation of said seal ring when the packing assembly is in functional position between said cylindrical element and said surrounding cylindrical surface.

4,576,386

ANTI-EXTRUSION BACK-UP RING ASSEMBLY

Alan M. Benson, Lawndale; John D. Mawer, Culver City, and Alan V. Ruzicka, Santa Monica, all of Calif., assignors to W. S. Shamban & Company, Santa Monica, Calif.

Filed Jan. 16, 1985, Ser. No. 692,354
Int. Cl.⁴ F16J *9/00, 15/24*
U.S. Cl. 277—165 **21 Claims**



1. A seal back-up assembly adapted for use in preventing the extrusion of the cap seal of an elastomer energized seal between two mating surfaces being sealed by said elastomer energized seal, one of said surfaces having a groove with sidewalls in which said elastomer energized seal is housed for sealing contact with the other surface, said cap seal including

a sealing surface for sealing contact with said other surface, first and second edges and a supporting surface, said elastomer energized seal further including a resilient expander element located below said cap seal in said groove and in contact with said supporting surface of said cap seal to bias said cap seal into sealing engagement with said other surface, said expander element including first and second edges, said seal back-up assembly comprising:

a first back-up ring located in said groove adjacent said cap seal first edge and a second back-up ring located in said groove adjacent said cap seal second edge, wherein each of said back-up rings includes:

an outer member made from a relatively hard, nonresilient material which is sufficiently strong to prevent extrusion of said cap seal;

an inner member made from a relatively soft elastic material which is sufficiently soft to prevent abrasion of said expander element; and

means for connecting said inner member to said outer member so that said outer member is prevented from contacting said expander element to provide said back-up ring for use in preventing the extrusion of said elastomer energized seal between the two mating surfaces being sealed.

4,576,387

ROTARY JOINT DEVICE WITH FLOATING SEAL RING FOR A CRYOGENIC FLUID

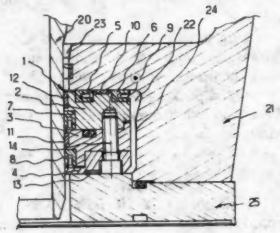
Jean P. R. F. Ghilardi, Montlignon, and Rémi F. Forget, Breval, both of France, assignors to Entreprise d'Equipements Mecaniques et Hydrauliques (E.M.H.), France

Filed Jul. 24, 1985, Ser. No. 758,458

Claims priority, application France, Jul. 26, 1984, 84 11901

Int. Cl.[4] F16J *15/18, 15/54*

U.S. Cl. 277—176 **7 Claims**



1. A device forming a rotary joint for a fluid, in particular a cryogenic fluid, comprising a stationary part and a rotary part rotatably mounted in relation to the stationary part, each one of the stationary and rotary parts comprising at least a corresponding duct adapted to the flow of the cryogenic fluid through the joint, fluid-tight means providing heat insulation of at least those walls of the joint which are contacted by the cryogenic fluid and which form the vital portions of the joints as in particular the walls located at the plane between the stationary part and the rotary part in relation to the surrounding medium, said heat insulating means comprising at least one fluid-tight annular chamber arranged in concentric relation to the cryogenic fluid flow duct surrounding same radially outwards, said annular chamber being closed in fluid-tight relationship by sealing means which at the connection between the rotary part and the stationary part include a floating ring providing fluid-tightness through radial and face-bound engagements, respectively, wherein the improvement consists in that said floating ring consists of at least two annular members assembled together and formed with recesses for accommodating the radially and face-wise acting sealing gaskets without any previous deformation of same for that purpose.

4,576,388

RECEPTACLE SUPPORT

Douglas R. Pope, 146 Warren Rd., Modbury North, South Australia, Australia 5092

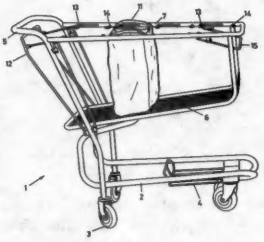
PCT No. PCT/AU83/00115, § 371 Date Apr. 24, 1984, § 102(e) Date Apr. 24, 1984, PCT Pub. No. WO84/00940, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 24, 1983, Ser. No. 606,833

Claims priority, application Australia, Aug. 24, 1982, PF5540

Int. Cl.[4] B65B *67/04*

U.S. Cl. 280—33.99 F **11 Claims**



1. A supermarket trolley of the type including a handle, wheels, an article support shelf and an upper frame, the trolley being characterised by a plurality of loop hooks adapted to engage with and support handles of a non-rigid handled container having an open top, said handles being located near the open top of the container for opening and closing the same, the hooks being arranged on the upper frame in pairs on opposite sides of and situated above the shelf, a first one of each of the pairs of hooks being movable from a first position to a second position relative to a second one of each of the pairs of hooks such that a container engaged by the hooks is opened when said first hooks are in said second position and is closed when said first hooks are in said first position, resilient means for biasing and moving said first hooks from said second position to said first position, actuating means for moving said first hooks to said second position and means for releasably retaining the first hooks in said second position whereby empty containers can be put in the trolley and engaged with said hooks with the container handles in an unstretched condition when said hooks are in said first position and then held open for loading by moving said first hooks to said second position, and loaded containers are closed by releasing said retaining means and for permitting loaded containers to be easily taken out of the trolley.

4,576,389

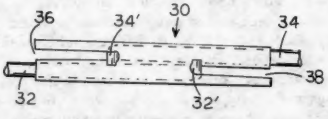
CART FOR TRANSPORTING SHOCK SENSITIVE LOADS, OR UNSTABLE LOADS

James Villaveces, 3300 San Luis St., Ventura, Calif. 93003, and Steven T. Golden, 822 Teaque Dr., Santa Paula, Calif. 93060

Filed Jan. 25, 1985, Ser. No. 695,253

Int. Cl.[4] B62B *1/04*

U.S. Cl. 280—43.16 **8 Claims**



1. A cart axle for transporting shock-sensitive computer equipment, components, and the like, comprising:

a main carrying base upon which is supported items to be transported, said main carrying base having a first axle with a wheel attached thereon, and a second axle with

another wheel attached thereon, said wheels rollingly supporting said main carrying base for movement;

said main carrying base further comprising means for mounting each of said first and second axles for selective and independent extension and retraction of said axles with respect to said main carrying base so as to accommodate various sizes and various weights of loads carried by said main carrying base;

said means for mounting comprising tube means for mounting said axles in overlapping relationship therein, said tube means having a first open end and a second open end spaced from said first open end, and a first slot adjacent said first open end and a second slot adjacent said second open end, each said slot being formed along a portion of the circumference of said tube means and extending from adjacent a respective said open end toward the center of said tube means, said tube means causing said axles to be held at a selected extension by friction between the inner surface of said tube means and the outer surfaces of said axles;

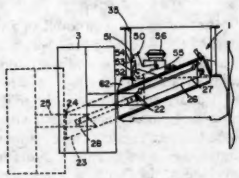
each of said first and second axles comprising a hook means at the end thereof remote from the end to which said wheel is attached, said hook means riding in a respective one of said slots disposed opposite thereto at one of said open ends opposite to the open end adjacent said attached wheel of said axle, whereby upon extension of said axle, said hook means abuts against the closed end of the respective slot to stop movement thereof, said axles overlapping in said tube means for at least some of the extensions thereof.

4,576,390

COMBINATION OUTRIGGER STABILIZER AND LIFT AXLE FOR VEHICLES

Henry J. Vos, 313 Baldwin, Jenison, Mich. 49428

Filed Sep. 13, 1983, Ser. No. 531,675
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—43.23 **21 Claims**



1. In a vehicle including a main frame portion and wheels, the improvement of a combination outrigger stabilizer and lift axle, comprising:

an extensible lift axle, having a ground engaging lift wheel rotatably mounted on an outer end thereof;

a retractable suspension arrangement, resiliently supporting said lift axle on a main frame portion of said vehicle;

means for bodily translating said lift axle in a vertical direction, between a raised, storage position wherein said lift wheel is lifted above the ground and is laterally aligned with other conventional wheels of said vehicle, and a lowered, weight supporting position wherein said lift wheel engages the ground in lateral alignment with said other conventional wheels, and supports the weight of the vehicle through said suspension arrangement;

means for longitudinally shifting said lift axle between an extended, outrigger position wherein said lift wheel contacts the ground at a location spaced laterally outwardly from said other conventional wheels of the vehicle to provide lateral stabilization to the vehicle, and a retracted, storage position wherein said lift wheel is raised above the ground and is drawn into lateral alignment with the other conventional wheels of the vehicle;

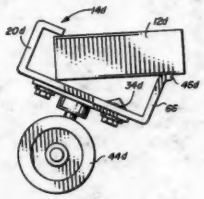
means for selectively deactivating said suspension arrangement and detachably connecting said lift axle directly with the main frame of said vehicle when said lift axle is in the raised, storage position, whereby said lift wheel provides lateral support directly to the main frame of said vehicle when said lift axle is in the extended, outrigger position, as well as resilient weight support when said suspension arrangement is reactivated, and said lift axle is moved into the lowered, retracted position to assist vehicle transport.

4,576,391

ROLLABLE PALLET ASSEMBLY AND CASTER DEVICE

Michael Gerstner, 11555 Hamlin, #3, North Hollywood, Calif. 91606

Filed Jul. 15, 1983, Ser. No. 513,811
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—79.1 R **4 Claims**



3. An improved knock-off caster device for a pallet, said device comprising, in combination:

(a) an upper generally horizontal plate,

(b) a lower generally horizontal plate,

(c) a first generally vertical web interconnecting said plates at one end thereof,

(d) a second generally vertically extending plate connected to the opposite end of said lower plate, said second plate lying opposite said web and extending upwardly from said lower plate,

(e) said upper plate having a length substantially shorter than the length of said lower plate, whereby a member of said pallet can be inserted into the cavity formed by said plates and web,

(f) a caster bracket connected to the underside of said second plate,

(g) a caster rotatably secured to and depending from said bracket,

(h) wherein said device includes a flange adapted to be struck to facilitate knocking off said device from a pallet, and

(i) wherein said flange is secured to the top of said second vertically extending plate.

4,576,392

HEIGHT ADJUSTMENT APPARATUS

Robert L. Quinlan, Jr., Cuyahoga Falls, Ohio, assignor to Gerber Products Company, Fremont, Mich.

Filed Dec. 7, 1984, Ser. No. 679,166
Int. Cl.[4] A47D *13/04*; B62B *7/06*
U.S. Cl. 280—87.02 W **6 Claims**

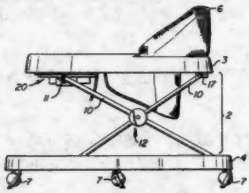
1. A catch assembly for adjustably fixing the height of an object mounted on first and second legs pivotally secured together to form a scissors frame collapsible in a longitudinal direction and attached thereto by a hinge joint at the top of said first leg, said assembly comprising:

a slide pivotally attached to the top of said second leg, and having first and second series of ratchet stops, each said series aligned parallel to said longitudinal direction;

a guide on said object for receiving said slide and permitting sliding thereof along said longtiudinal direction;

first and second pawls pivotally attached to aid object and biased to engage said first and second series of ratchet

stops, respectively, from opposite sides of said slide and to limit the motion of said slide in the direction away from said hinge joint; and



a handle extending backward from the rear of each of said first and second pawls to permit simultaneous release of said pawls by squeezing said handles together.

4,576,393

BICYCLE SUSPENSION

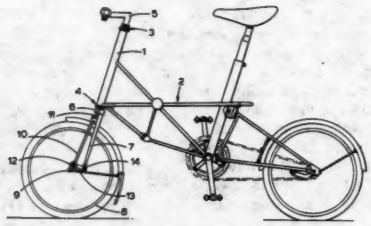
Alexander E. Moulton, and Philip B. Uncles, both of Bradford on Avon, United Kingdom, assignors to Alex Moulton Limited, Wiltshire, England

Filed Dec. 1, 1983, Ser. No. 556,935

Claims priority, application United Kingdom, Dec. 1, 1982, 8234232

Int. Cl.[4] B62K *21/16, 21/22*

U.S. Cl. 280—276 **1 Claim**



1. A resilient suspension system for the front wheel of a bicycle comprising a supporting frame (**1**), a steering column (**1A**) rotatably mounted within said frame and carrying a first crown (**6**) element at one end thereof, and a stem (**5**) supporting a handle bar (**5A**) at the other end, a primary fork including a pair of primary fork arms (**7**) mounted on said crown (**6**) with its longitudinal axis displaced to the rear and generally parallel to the axis of said steering column (**1A**), said primary fork extending downwardly from said crown and terminating in a hinge pin support (**14**), a subsidiary fork assembly includes a second crown (**10A**) from which a pair of subsidiary fork arms (**10**) extend downwardly and supporting at their lowermost end an articulated connection configured to receive and support each end of a wheel spindle (**9**), a pair of links (**13**) pivotally interconnecting the primary and subsidiary forks adjacent each end of the spindle, a push rod (**11**) mounted on said second crown (**10A**) and extending vertically therefrom into the lower end of said steering column, and a compression assembly including a compression spring (**22**) within said steering column and connected to said push rod (**11**) for controlling resilient vertical movement of said suspension system, and wherein a slidable buffer (**23**) is interposed between said compression spring (**22**) and said second crown (**10A**), said buffer (**23**) being slidable within the steering column (**1***a*) in response to movement of the crown (**10A**) and said push rod (**11**), said buffer (**23**) being threaded on to the push rod (**11**) and being adjustable axially of the rod.

4,576,394

TRACTOR

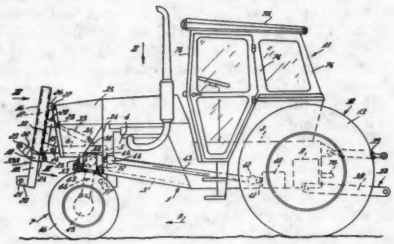
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Aug. 30, 1983, Ser. No. 527,682

Claims priority, application Netherlands, Aug. 31, 1982, 8203382

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—490 A **20 Claims**



1. Agricultural tractor for operating at least a tillage machine for seed bed preparation, said machine being connected to a three-point lifting device of the tractor, said lifting device comprising:

a hitching frame extending transverse to the tractor's plane of symmetry, said hitching frame having three coupling points, the lower two of said points being at the same level and below as seen in side elevation an upper of said points;

upstanding beam means rigidly connected at its lower end to the upper aspect of said hitching frame;

guiding beam means which surrounds at least in part said upstanding beam means so that said upstanding beam means is movable both upwardly and downwardly in said guiding beam means, said guiding beam means being in all positions completely spaced higher than said lower coupling points;

said guiding beam means being pivotally connected to the remaining part of the tractor by pivot means;

first hydraulic jack means between said guiding beam means and said hitching frame for moving the latter relatively to the former upwardly and downwardly; and

second hydraulic jack means connected with said guiding means at a location relative to said pivot means so that on actuation said lower two points move fore and aft at approximately the same level relative to the remaining part of the tractor in an arcuate path, said level being determined by said first hydraulic jack means;

said first and second hydraulic jack means having control means which can be reached by the tractor's operator from the tractor's driver's seat.

4,576,395

TRAILER HITCH MOUNTED TOOL SUPPORT

Heron Longoria, 713 N. 16th St., McAllen, Tex. 78501

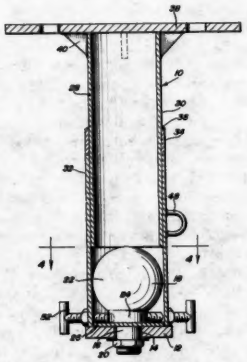
Filed Apr. 26, 1984, Ser. No. 604,361

Int. Cl.[4] B60R *9/06*

U.S. Cl. 280—511 **12 Claims**

1. A support for use in conjunction with a conventional trailer hitch of the type including a horizontally projecting bar portion having an upper surface and a hitch ball projecting upwardly from said bar portion including an upper generally spherical ball portion, a shank depending downwardly from said ball portion and extending and secured downwardly through said bar portion and an enlarged abutment disc on an intermediate portion of said shank downwardly abutted against the upper surface of said bar portion and being of substantially the same outside diameter as the diameter of said ball portion and with said upper surface projecting horizontally outwardly of an upstanding cylindrical zone containing the outer periph-

eries of said ball portion and abutment disc, said support including an upstanding support whose lower end defines a downwardly opening cylindrical cavity therein for snug downward telescoping of the lower end of said support member over said ball portion and abutment disc and with the lower end of said support member downwardly abutted against said upper surface, said support member including a



plurality of peripherally spaced setscrews threadingly supported therefrom and projectable and retractable generally radially of said cylindrical cavity at a predetermined level above the lower end of said cavity for clamp engagement with said shank intermediate said ball portion and disc, the upper end of said support including mounting means for mounting various different objects from the upper end of said support.

4,576,396

ELECTRONIC SKI-BINDING

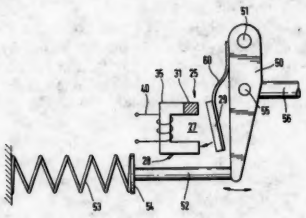
Lorenz Stempfhuber, Oberau, Fed. Rep. of Germany, assignor to Marker International Company, Salt Lake City, Utah

Filed Mar. 5, 1985, Ser. No. 708,273

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408335

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—612 **10 Claims**



1. An electronic ski binding having a release mechanism for releasing a ski boot from the binding in response to electrical release signals reflective of the application of forces of a predeterined value applied to the binding, said binding comprising:

an electrical load for generating and processing electrical signals reflective of the value of forces applied to the binding and for generating the electrical release signals; an electrical energy source connectable to the electrical load;

an electronic switch actuable to an on condition for connecting the electrical source to the electrical load in response to control signals;

a movable part which is movable in response to a ski boot entering the binding;

control signal generating means for generating control signals for actuating the electronic switch to the on condition, said control generating means comprising induction coil means and magnet means; and

processing means electrically connected to the electronic switch, one of said induction coil means and said magnet means being mounted on said movable part for movement relative to the other of said coil means and said magnet means in response to the entry of the ski boot into the binding for inducing an electrical control signal in said induction coil means for actuating said electronic switch to the on condition, and said processing means generating an output signal to the electronic switch for maintaining said electronic switch in the on condition in response to the generation of said control signals.

4,576,397

ADJUSTMENT DISPLAY FOR SKI BINDING

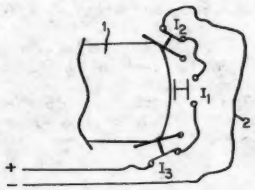
Pierre Rullier, Annecy, France, assignor to Salomon S.A., Annecy, France

Filed Jan. 25, 1984, Ser. No. 573,643

Claims priority, application France, Feb. 11, 1983, 83 02726

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—625 **56 Claims**



1. An apparatus for displaying the state of adjustment of a ski binding having at least one maintenance element adapted to be displaced with respect to a boot in a horizontal plane into first and second states of adjustment, wherein in said first state of adjustment said at least one maintenance element is properly adjusted with respect to said boot in a horizontal plane, wherein in said second state of adjustment said at least one maintenance element is improperly adjusted with respect to said boot in a horizontal plane, wherein said apparatus comprises:

(a) sensor means for sensing the first and second states of adjustment of said at least one maintenance element with respect to said boot in a horizontal plane; and

(b) indicator means for emitting a percepticle signal to indicate the horizontal state of adjustment of said at least one maintenance element with respect to said boot in response to said sensor sensing at least one of said states of adjustment of said at least one maintenance element.

4,576,398

TRAILER FRAME STRUCTURE

Stanley F. Kinne, Portland, Oreg., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 20, 1984, Ser. No. 642,490

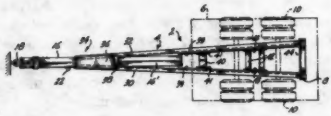
Int. Cl.[4] B62D *63/06*

U.S. Cl. 280—789 **8 Claims**

1. A trailer unit which comprises:

a. a frame comprising a pair of substantially side-by-side longitudinally extending, generally gable-shaped solid web truss members, said members diverging laterally in V-shaped fashion from a proximal end apex zone to a distal end, lower flanges of said truss members being inclined from a lower level adjacent to the apex zone to a relatively higher wheel means engaging level, said web truss members having a body supporting rear portion with

an upper flange member substantially parallel to the ground, whereby the web of said rear portion increases in vertical dimension from said distal end to a gable peak, and said web truss members further having a converging portion extending forwardly from said gable peak whereby the web of said converging portion decreases in vertical dimension from said gable peak toward said apex,



said longitudinal members being cross-braced by at least one transverse bridging member;

b. a body supported by the rear portion of the frame with the forward portion of the body located adjacent to the gable peak of the truss members;

c. wheel means supporting the rear portion of the frame; and

d. hitch means located at the apex zone of the frame.

4,576,399

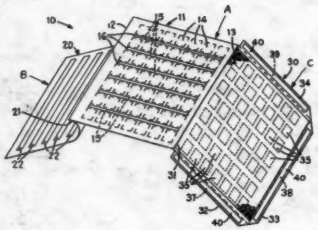
BLINDED CODE SHEET FORMAT AND METHOD FOR ITS USE

Cathleen A. White, Lawton; Richard K. Senne, Scotts, and Harry Rutherford, Kentwood, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 7, 1983, Ser. No. 549,706

Int. Cl.[4] B41L *1/20*; B42D *11/00, 15/00, 15/04*

U.S. Cl. 282—8 R **5 Claims**



1. A three-paneled code sheet construction form useful to control blinded clinical trials of drugs and chemicals, which comprises (A) a first panel for test messages of generally single ply configuration having a number of substantially spaced writing areas on one writing mode side thereof, with room in the spaced writing areas sufficient for writing code designations and an appropriate test message

said panel (A) having one or more lines of adhesive bonded to said writing mode side of said first panel (A),

said adhesive being covered by removable strips of an adhesive protective liner to prevent the adhesive from sticking until ready for closing of said code sheet construction form,

the other side of said first panel (A) being covered with a security format;

(B) a removable, second panel of generally single ply construction removably connected to said panel (A) at one edge thereof, and

said panel (B) having spaces of writing transference substance printed or otherwise adhering to the side of said second panel which places the writing transference substance in a position to transfer said code designation writing therethrough from panel (A) to a third panel (C), without transferring any said message to said third panel (C) in a writing mode when writing is made on panel (A); and

(C) said third panel of generally single ply configuration hingedly interconnected with said first panel (A) along a second edge thereof;

said third panel (C) having a number of spaced perforated perimeter areas thereon,

said perforated perimeter areas approximating the size, shape, and area of the spaced writing areas on said panel (A), and

which perforated perimeter areas are spaced on said third panel (C) to line up essentially coextensively in essential registered relationship with the spaced writing areas on said first panel (A), when said panels (A), (B) and (C) are folded together for said writing mode;

said panels (A), (B) and (C) being arranged so that when said code designations and tests messages are written on said first panel (A) said code designation writings will be impressed through said first panel (A) and said second panel (B) to the corresponding perforated perimeter areas of said third panel (C) but the test message will not be transferred to said panel (C), and

means to fold panels (A) and (C) approximately 360 degrees after the writing mode is completed to an in-line, closed, sealed relationship to each other, so that the spaced writing areas of panel (A) will be essentially covered and be in an essentially in-line relationship with the the perforated perimeter areas of panel (C), and

means to seal the outer edges of said folded, closed, in-line panels (A) and (C) into essentially a folded construction, having the written-on writing areas of panel (A) in-line with and being covered by perforated perimeter areas of panel (C).

3. A method for arranging test sample code and sample identity designations using a multi-panel format which comprises

(1) folding the three panel format of claim 1 to the writing mode,

(2) writing the code designations and the message to be hidden in a number of said spaced writing areas of panel (A), so that the code designation will be impressed through the transfer substance spaces of the second panel (B) to the corresponding perforated perimeter area of the third panel (C), but so that the message to be hidden will not be transferred from panel (A),

(3) removing the transfer panel (B) from the above three panel format and any protective liner strips from any adhesive lines on panel (A),

(4) fold or turn panel (A) or (C) in an essential 360 degree arc along the hingedly connected edge of panel (A) and (C) to line up panels (A) immediately behind panel (C) so that the spaced writing areas of panel (A) are in registered relationship with the corresponding perforated perimeter areas of panel (C), and

(5) sealing the resulting folded panel (A)/panel (C) format to ensure integrity of the blinded hidden messages on panel (A) under the corresponding perforated areas of panel (C).

4,576,400

RISER REPAIR ASSEMBLY FOR UNDERGROUND IRRIGATION SYSTEMS

Von D. Allred, P.O. Box 24, and Don B. Harmon, P.O. Box 546, both of Afton, Wyo. 83110

Filed Feb. 10, 1984, Ser. No. 578,978

Int. Cl.[4] F16L *19/00*

U.S. Cl. 285—5 **11 Claims**

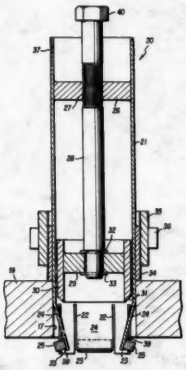
1. A repair assembly for broken or leaking risers in underground irrigation systems comprising:

an elongated cylindrical casing having a top end and a bottom end, said botton end adapted for insertion into a circular hole through the wall of a buried water distribution line;

a plurality of slots cut into said botton end parallel to the axis

of said cylindrical casing, said slots defining a plurality of tang members, each of said tang members having an attached end and a free end;

outwardly extending lugs fixed to the exterior of alternate tang members, the free ends of said tang members with affixed lugs bent inwardly a sufficient degree that said lugs



do not project beyond the diameter of said cylindrical casing;

wedge means disposed within said casing and adapted to move downwardly to spread said lug affixed tang members outwardly, and

a retaining flange disposed about the exterior of said casing at a lower section thereof above said tang members.

4,576,401

LEAK REPAIR CLAMP

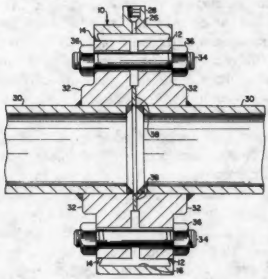
George W. Harrison, Houston, Tex., assignor to Team, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 925,425, Jan. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 832,112, Sep. 12, 1977, Pat. No. 4,049,296. This application Sep. 17, 1984, Ser. No. 650,842

The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.

Int. Cl.[4] F16L *55/18*

U.S. Cl. 285—15 **5 Claims**



1. In an improved self-contained leak repair clamp, the combination comprising:

(a) a circular metal frame formed of at lease two frame segments adapted for forceful connection around and against a cylindrical surface;

(b) said frame defining two integral deformable metal lips extending radially inwardly and disposed in parallel relation about the inner periphery of each frame segment of said frame to form an annular cavity between said frame and said cylindrical surface;

(c) each of said metal lips being adapted to be deformed inwardly toward the other of said lips in response to said forceful connection to form a respective fluid tight seal between an edge of each said metal lip and said cylindrical surface;

(d) said sealing force of each said respective fluid tight seal being adapted to be increased in response to fluid pressure applied to within said annular cavity;

(e) said annular cavity being adapted to receive a liquid sealant cured while under fluid pressure to form a seal between said lips in addition to each said respective seal; and

(f) means for forcefully connecting said frame segments together to form said circular metal frame and said sealed annular cavity.

4,576,402

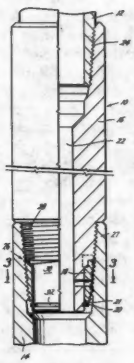
LOCKING PIPE SUB

W. Kirby Murray, and David O. Sullivan, both of Bossier City, La., assignors to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed Mar. 21, 1983, Ser. No. 477,164

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—39 **9 Claims**



1. An apparatus for making a locked threaded connection between said apparatus and a threaded object, said apparatus comprising:

a body;

a first threaded portion on said body;

a second threaded portion adjacent to said first threaded portion and mounted on said body for axial movement relative to said first threaded portion;

said first and second threaded portions adapted to form a continuous threaded surface and to rotate together to threadedly engage said first and second threaded portions with said object when said body is rotated in a first direction relative to said object; and,

means for axially displacing said first and second threaded portions relative to each other when said body is rotated in a direction opposite to said first direction, whereby said first and second threaded portions may not be removed from threaded engagement with said object by rotation of said body in a direction opposite to said first direction.

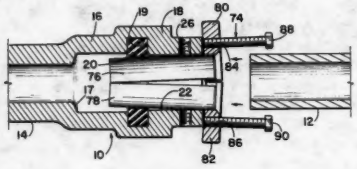
4,576,403
PRESSURE FITTING

Jack Burkholder, Rte. 2, Box 170AA, Eastland, Tex. 76448

Continuation of Ser. No. 446,462, Dec. 3, 1982, abandoned. This application Feb. 4, 1985, Ser. No. 698,083

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—39 **1 Claim**



1. Pipe fitting means for connecting a pair of adjacent pipe joints in tandem relation and comprising bell means integral with one end of the pipe joint for receiving one end of the other pipe joint therein, sealing means disposed between the inner periphery of the other pipe joint, clamping means extending through the side wall of the bell means and engagable with the other pipe joint for securing the bell means on the other pipe joint, the clamping means comprising axially extending means provided at one end of the bell means, and set screw means extending through the axially extending means for engagement with the outer periphery of the pipe to secure the fitting on the pipe, and wherein the axially extending means comprises a plurality of circumferentially spaced axially extending lug means, each lug means being provided with a threaded aperture for receiving a set screw therethrough, said set screw being selectively engagable with the outer periphery of the pipe for securing the fitting to the pipe, and including helper tool means adapted for removable insertion between the bell means and the pipe for facilitating insertion of the pipe into the bell means to preclude damage of the sealing means, said helper tool means comprising a pair of substantially identical oppositely disposed semi-cylindrical sleeve members adapted to be disposed within the ball means prior to insertion of the pipe therein, and removal means provided on each semi-cylindrical sleeve member for facilitating removal of the helper tool means subsequent to the insertion of the pipe into the ball means and wherein the removal means additionally includes outwardly extending flange means provided around the outer periphery of each semi-cylindrical sleeve member and jack screw means extending longitudinally through each flange means and engagable with the outer end of the bell means for facilitating removal of the helper tool means subsequent to the insertion of the pipe into the barrel means.

4,576,404
BELLOWS EXPANSION JOINT

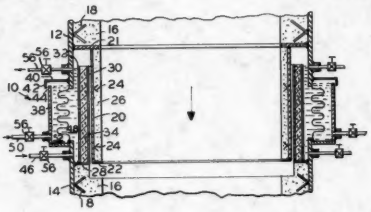
Paul S. Weber, Baytown, Tex., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 4, 1983, Ser. No. 520,433

Int. Cl.⁴ F16L *53/00*

U.S. Cl. 285—41 **8 Claims**

1. An improved expansion joint for use in a high temperature gas vertically oriented conduit containing acid producing compounds comprising, flexible cylindrical bellows means, upper and lower rigid conduit means secured to the opposite ends of said bellows means, inner cylindrical sleeve means attached to said lower conduit means and spaced from said bellows means extending toward said upper conduit means to terminate in an upper rim portion at a point in overlapping relation with said upper conduit means to define a first chamber for containing an acid neutralizing solution in contact with the inner surface of said bellows means, external cylindrical jacket means attached to said lower conduit means and spaced from said bellows means to terminate in an upper rim portion above said bellows means to define a second chamber for containing an acid neutralizing solution in contact with the outer surface of said bellows means, means for introducing said acid neutralizing solution into lower portions of each of said first and second chambers, and means for discharging solution



from said chambers above the upper end of said bellows means, whereby said solution may be introduced into said chambers to purge and neutralize any acid in contact with said bellows means during any cooldown of said expansion joint from its normal high temperature of operation.

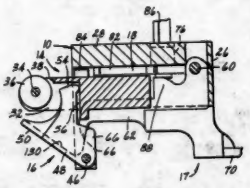
4,576,405
DOOR LATCH MECHANISM

George Wartian, East Detroit, Mich., assignor to Wartian Lock Co., St. Clair Shores, Mich.

Continuation of Ser. No. 457,497, Jan. 12, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,512

Int. Cl.⁴ E05C *1/16*

U.S. Cl. 292—191 **2 Claims**



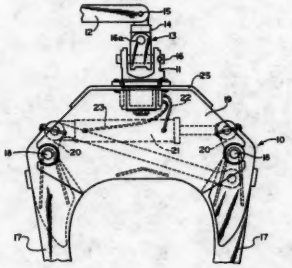
1. A door latch mechanism comprising a housing adapted to be mounted on the inner side of a door, a sliding latch mounted on said housing for sliding movement from a retracted position to an extended position in which it is adapted to engage behind a keeper to hold the door closed, said latch having an abutment surface, spring means urging said latch to its extended position, an actuator pivoted on said housing for pivotal movement from a retracted to an extended position, said actuator having a first arm engageable with said abutment surface of said latch to retract said latch when said actuator is pivoted to its retracted position, said actuator having a second arm positioned and adapted, when said housing is mounted on the door as aforesaid, to cam past said keeper during closing of the door and in the process to pivot said actuator to its retracted position, said actuator having a third arm, an operator pivoted on said housing and having a part engageable with said third arm of said actuator to pivot said actuator to its retracted position when said operator is pivoted in one direction, said operator having a handle portion located on the inner side of the door when said housing is mounted on said door as aforesaid to enable manually pivoting said operator in said one direction from the inner side of the door, said operator having an abutment surface, a manually operated pushed rod extending into said housing from the outer side of said door when said housing is mounted on said door as aforesaid, and means on said housing mounting said push rod for axial sliding movement, said push rod having an end engageable with said abutment surface

of said operator to pivot said operator in said one direction in response to axial movement of said push rod in one direction.

4,576,406
ROTATIONAL GRAPPLE

Thomas E. Johnson, and Terrance D. Spencer, both of Woodstock, Canada, assignors to Timberjack Inc., Woodstock, Canada

Filed May 7, 1984, Ser. No. 607,881
Int. Cl.⁴ B66C *3/00*
U.S. Cl. 294—86.41 **7 Claims**

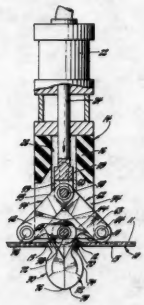


1. An apparatus for rotating a suspended material handling unit comprising an elongated housing, means to suspend the upper end of said housing from a pivotable support, a rotor member having a material handling unit mounted thereto, a bearing means mounted externally of said housing and between the ends of said elongated housing for rotationally supporting said rotor member relative to said housing, a fluid operated rotary motor mounted internally of said housing and having a vertical drive shaft depending from the bottom of said housing, drive means operatively connected to said vertical drive shaft for rotating the rotor member and material handling unit relative to the housing, a hydraulic swivel sleeve mounted on the external surface of said housing below said bearing means, said sleeve mounted on said housing for rotation relative thereto, a fluid operated motor for actuating said material handling unit, and fluid conducting means interconnecting said fluid operated motor, said swivel sleeve and a source of operating fluid.

4,576,407
ROBOT HAND FOR LIFTING APERTURED PANEL

George F. Lambert, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1985, Ser. No. 694,022
Int. Cl.⁴ B25J *15/08*; B66C *1/66*
U.S. Cl. 294—97 **1 Claim**



1. A hand for a robot adapted particularly to pick up and hold a panel having a topside, an underside, and an aperture therethrough defined by an aperture wall, comprising:

a housing mounted on an arm of the robot and having a locating surface;

first and second tong fingers having upper ends, pivot portions pivotally mounted on the housing and lower ends depending beyond the locating surface of the housing;

each of said tong fingers having a generally spherical knuckle facing in the opposite direction from the knuckle of the other tong finger and cooperating therewith to define opposing upper hemispherical cam faces and opposing lower hemispherical cam faces;

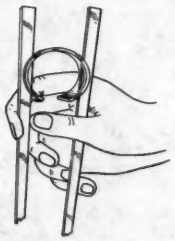
operating means associated with the upper ends of the first and second tong fingers and adapted to pivotally move the tong fingers between pinched together contracted positions in which the upper ends of the tong fingers also depend below the locating surface of the housing and the knuckles are smaller than the aperture to permit insertion of the tong fingers through the panel aperture, and spread apart positions in which the upper ends of the tong fingers are raised above the locating surface of the housing and the panel is captured between the upper hemispherical cam faces of the tong finger knuckles and the housing locating surface;

said lower hemispherical cam faces cooperating upon insertion of the tong fingers to engage the aperture wall in the event that the panel is misaligned with respect to the tong fingers to shift the panel to facilitate insertion, and said upper heimspherical cam faces cooperating upon movement of the tong fingers to the spread apart position to engage against the underside of the panel and lift the panel into engagement with the locating surface of the housing; and subsequent return movement of the tong fingers to the pinched together contracted position again moving the tong finger upper ends to the position depending below the locating surface of the housing to engage with the topside of the panel and thereby assure that the panel is dislodge from the locating surface and ejected from the robot hand.

4,576,408
CHOPSTICK HOLDER

Satome Maneki, 3445 N. Verdugo Rd., Glendale, Calif. 91208

Filed Dec. 15, 1983, Ser. No. 561,834
Int. Cl.⁴ A47G *21/10*; A47J *43/28*
U.S. Cl. 294—99.2 **2 Claims**



1. A chopstick holder consisting of a unitary interrupted generally circular uniform dimension ring of resilient material;

said interrupted ring having a pair of ends defining a gap therebetween;

said interrupted ring further defining a pair of elongated arc-like slots in the wall thereof;

said elongated arc-like slots having a width corresponding to the thickness of a chopstick and having a length sufficient to confine one chopstick in each of said slots by frictional engagement of the sides of the chopstick with the sides of said slots after lateral insertion of chopsticks in said slots;

said slots positioned whereby a pair of chopsticks secured in respective slots are angled towards each other but with the ends out of contact and having sufficient spacing therebetween to allow the user to place a morsel of food therebetween;

said holder being compressible by the user sufficiently to allow the morsel to be picked up without the ends of the gap closing; and

the pressure of the user in picking up a morsel being applied in a direction which urges the chopsticks into their respective slots.

4,576,409

SUN VISOR WITH MOLDED STIFFENING FRAME

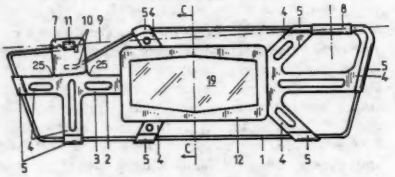
Charles Ebert, Luxeuil, France, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 561,051

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246784

Int. Cl.⁴ B60J *3/00*

U.S. Cl. 296—97 H **20 Claims**



1. A sun visor for vehicles, or the like, comprising:

a generally flat visor body;

a reinforcing insert embedded in the visor body for reinforcing the visor body against deformation; the insert being in the form of an elongate thin strip extending around the visor body and the insert defining a generally rectangular frame with an area surrounded by the frame; the generally rectangular frame having opposite long arms joined by opposite short arms for defining the generally rectangular shape thereof;

a frame stiffener for the reinforcing insert, the frame stiffener being a single piece plastic injection molding located in the area surrounded by the frame; the stiffener including a longitudinal brace having opposite ends which are on the opposite short arms of the reinforcing insert and the stiffener also including a plurality of transversely extending braces extending transversely of the longitudinal brace and each also having ends which are on the long arms of the reinforcing insert;

the ends of the longitudinal brace and of the transverse braces being injection molded directly on the respective arms of the reinforcing insert.

4,576,410

LUMBAR SUPPORT FOR A BACKREST

Takemi Hattori, Kariya, Japan, assignor to Aisen Seiki Kabushika Kaisha, Japan

Filed May 25, 1983, Ser. No. 497,758

Claims priority, application Japan, May 26, 1982, 57-88114

Int. Cl.⁴ A47C *3/36*

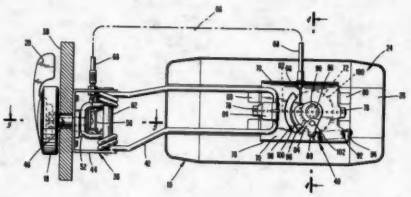
U.S. Cl. 297—284 **14 Claims**

1. A lumbar support for a backrest having a lumbar portion designed to be vertically aligned with the lumbar region of a user of the backrest, said lumbar support being adjustable according to a desired adjustment setting operated by regulating means and comprising:

a. a support plate having front and rear surfaces, at least a portion of said front surface engaging the rear of said lumbar portion of said backrest to define an effective contact region, the vertical position of which on said backrest varies with the vertical inclination of said support plate;

b. bracket means in fixed vertical position relative said backrest, said first bracket means pivotally supporting said support plate to permit changes in the vertical inclination of said support plate, said bracket means including a pawl rotatably connected thereto;

c. a cam member disposed between said support plate and said bracket means and rotatably fixed to said bracket means and rotatable to rotate said support plate to change said vertical inclination of said support plate, said cam



member having at least one ratchet tooth at the periphery thereof;

d. control means for rotating said cam member by an amount determined by the regulating means to vertically align said effective contact region with said lumbar region of a user said control means also including:

transmission means connected to the regulating means for producing an activating force;

means connected between said transmission means and said pawl for rotating said pawl in response to said activating force produced by said transmission means; and

means for engaging said pawl and said at least one ratchet tooth to rotate said cam.

4,576,411

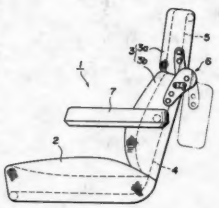
VEHICLE SEAT

Masahiro Kitamura, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Feb. 2, 1984, Ser. No. 576,482

Int. Cl.⁴ A47C *1/00*; E05D *11/10*

U.S. Cl. 297—353 **8 Claims**



1. A vehicle seat comprising:

upper and lower seat back portions respectively including upper and lower side plates;

connecting means for connecting said upper side plate of said upper seat back portion to said lower side plate of said lower seat back portion so that said upper seat back portion is capable of pivotal movements relative to said lower seat back portion about a pivot axis between an extended position wherein said upper seat back portion extends above said lower seat back portion, and a folded position wherein said upper seat back portion is adjacently folded against said lower seat back portion;

a lock guide plate, said connecting means pivotally coupling said lock guide plate to said upper side plate and said lower side plate for independent pivotal movements relative thereto about said pivot axis;

said upper side plate including means defining first and second recesses for respectively establishing said extended and retracted positions of said upper seat back portion, and projection means rigidly carried with said upper side plate during said rotational movements about said pivot axis;

said lock guide plate including means defining a lock recess selectively registrable with said first and second recesses when said upper seat back portion is pivoted into said extended and folded positions, respectively, and first and second opposing engagement surfaces; and

locking means for removably locking said upper seat back portion in said extended and retracted positions, said locking means including engagement means movable between (i) an engaged position wherein said engagement means is accepted in said lock recess and one of said first and second recesses in registry therewith to removably lock said upper seat back portion in said extended and folded positions, respectively, and (ii) a disengaged position wherein said engagement means is operatively separated from said lock recess and said one of said first and second recesses in registry therewith;

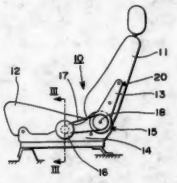
said projection means (a) for engaging said first surface of said lock guide plate in response to pivotal movement of said upper seat back portion in a first direction forwardly of said extended position to cause said lock guide plate to also be pivotally moved in said first direction together with said upper side plate such that said registered first recess and said lock recess become misaligned with said engagement means to thereby move said engagement means from said engaged position and into said disengaged position, (b) said engagement means being maintained in said disengaged position to permit said upper seat back portion to be pivoted in a second direction, opposite to said first direction, until said projection means engages said second engagement surface, (c) said projection means thereafter for pivoting said guide lock plate in said second direction together with said pivotal movement of said upper side plate to register said lock recess and said second recess with said engagement means to release said engagement means from said maintained disengaged position and to cause said engagement means to move into engagement with said lock recess and said second recess whereby said upper seat back portion is removably locked in said folded position.

4,576,412

SEAT RECLINING MECHANISM

Takami Terada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Mar. 14, 1985, Ser. No. 711,648
Claims priority, application Japan, Mar. 15, 1984, 59-50718
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—362 **5 Claims**



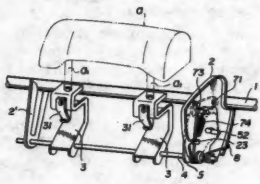
1. A seat reclining mechanism comprising an uppr bracket adapted to be secured to a seat back of a seat assembly, a lower bracket adapted to be secured to a seat cushion of the seat assembly, an internal gear provided on one of said upper and lower brackets, an external gear provided on the other of the upper and lower brackets and adapted for meshing engagement with said internal gear, said external gear being smaller in number of gear teeth than said internal gear, an eccentric shaft having a shaft portion journalling one of said gears and an eccentric portion journalling the other of said gears so that the gears are engaged with each other at a circumferential position, said eccentric shaft being journalled through bearing means on said other of said brackets, a manually operable knob shaft rotatably carried by said other braket, rotation transmitting means between said knob shaft and said eccentric shaft for transmitting rotaiion of said knob shaft to said eccentric shaft, rotation restricting means provided between said knob shaft and said other bracket for restricting said knob shaft against rotation under a force applied from said eccentric shaft but permitting a rotation of said knob shaft under a manual actuating force directly applied thereto.

4,576,413

HEAD-REST INCLUDING A DEVICE TO PERMIT PIVOTAL ADJUSTMENT THEREOF RELATIVE TO A VEHICLE SEAT

Susumu Hatta, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Japan

Filed Feb. 23, 1984, Ser. No. 583,031
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—408 **10 Claims**



1. A head-rest for a vehicle seat wherein stays of a head-rest body are pivotally mounted to a seat back frame so as to permit the head-rest to be pivotally moved longitudinally of the vehicle, said head-rest comprising:

mounting brackets associated with said seat back frame of said vehicle seat and defining a large-sized elongated slot;

a rotation shaft rotatably mounted to said back frame through said bracket;

a lock plate fixed to said shaft and defining a plurality of locking grooves;

support means fixed to said shaft for supporting said stays of said head-rest body;

said lock plate and support means thereby being rotated when said shaft rotates;

said bracket including a stopper selectively engageable with said locking grooves defined in said lock plate; and,

lock release means rotatably mounted to said shaft to release the engagement of said stopper with said locking grooves, said lock release means including

(a) a return plate rotatably mounted to said shaft on an opposite side of said lock plate relative to said bracket and defining an engaging step portion and a small-sized elongated slot in registry with said large-sized elongated slot;

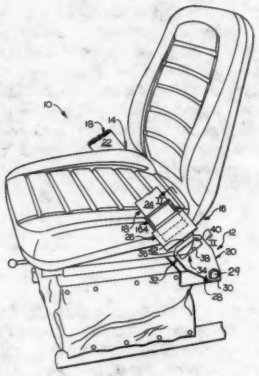
(b) said stopper including a first pin engageable with said engaging step portion of said return plate; and

(c) a second pin provided on a side surface of said lock plate and inserted through said large-sized and small-sized elongated slots.

4,576,414
SEAT BELT APPARATUS

John Molnar, Aurora, and Robert B. Porter, Jr., Elburn, both of Ill., assignors to Caterpiller Tractor Co., Peoria, Ill.

Filed Jan. 27, 1984, Ser. No. 574,793
Int. Cl.[4] B60R *21/10*
U.S. Cl. 297—476 17 Claims



1. In a seat belt apparatus adapted for use with a seat assembly having a first belt portion anchored to a first side of the seat assembly and a second belt portion anchored to a second side of the seat assembly, a tongue member associated with a free end of the second belt portion, and a buckle member having a recoil spool mounted therein associated with a free end of the first belt portion in a manner to wind the free end of the first belt portion around the recoil spool, said buckle member having a receptacle defined on one end thereof and being movable toward the tongue member for engagement of said tongue member within said receptacle, the improvement comprising:

a latch member mounted on said buckle member and being positionable for holding the tongue member within the buckle member; and

a latch release member having an aperture formed therein and being mounted on the buckle member to extend from an end thereof opposite the end defining said receptacle and being slidably movable in a linear direction away from the tongue member to release the latch member from engagement with the tongue member and to move the buckle member away from the tongue member in a single motion.

4,576,415
WHEEL TRIM RETENTION SYSTEM

Heinrich J. Hempelmann, Livonia, Mich., assignor to NI Industries, Inc., Novi, Mich.

Continuation-in-part of Ser. No. 352,570, Feb. 26, 1982, abandoned. This application Feb. 15, 1983, Ser. No. 465,222
Int. Cl.[4] B60B *7/00*
U.S. Cl. 301—37 S 47 Claims

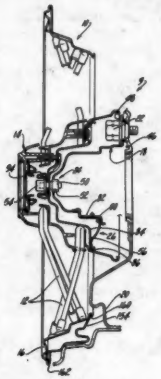
1. A wheel trim assembly for a vehicle wheel, comprising:

a trim member;

a lock bracket adapted to be secured to an axially outwardly facing surface of said wheel;

retention means for detachably securing said trim member to said lock bracket; and

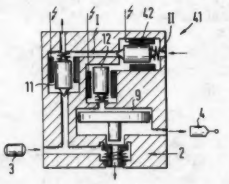
anti-rotation means for preventing relative rotation between said trim member and said vehicle wheel, said anti-rotation means including first means on said trim member and second means on said lock bracket engageable with said first means to allow said trim member to be initially angularly positioned with respect to said lock bracket in any one of a number of relative angular positions and to thereafter resist relative rotation therebetween, one of said first and second means being operable to move generally radially into non-slipping engagement with the other in response to axial movement of said trim member toward said lock bracket and wheel.



4,576,416
MULTI-CIRCUIT PRESSURE MEDIUM BRAKE SYSTEM

Egbert Müller, Hochdorf, and Werner Stumpe, Kornwestheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 415,951, Sep. 8, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 676,606
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205228
Int. Cl.[4] B60T *8/02, 15/18*
U.S. Cl. 303—15 19 Claims



1. A brake system comprising a fluid pressure source from a fluid pressure line, at least one brake cylinder connected to said fluid pressure line which is initiated in accordance with a brake pedal position, at least one fluid pressure control valve in said fluid pressure line in said brake system which controls fluid under pressure from said fluid pressure source to said at least one brake cylinder, a relay control valve in said at least one fluid pressure control valve that controls fluid flow from said fluid pressure source to said at least one brake cylinder, first and second pressure control lines in said at least one fluid pressure control valve that applies fluid under pressure which operates said relay control valve, said at least one fluid pressure control valve including electromagnetic switching valves therein connected to and controlled by a first of two simultaneously operated brake control circuits which controls fluid under pressure from said first fluid pressure control line to said relay control valve for controlling flow of fluid under pressure through said at least one pressure control valve to said at least one pressure brake cylinder for operation thereof, and said

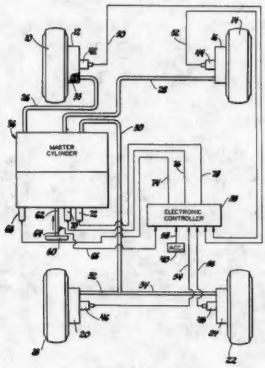
second fluid pressure control line is connected to a second of said two simultaneously operated brake control circuits for operation of said relay control valve in the event said electromagnetic switching valves malfunction.

4,576,417

POWER ASSISTED BRAKING SYSTEM WITH WHEEL LOCK CONTROL

Donald J. Dobner, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1985, Ser. No. 697,743
Int. Cl.[4] B60T *8/44*; F15B *7/00, 15/18*
U.S. Cl. 303—15 **4 Claims**



1. For use in a vehicle having front wheels and rear wheels and a wheel brake for braking each of said wheels, a wheel brake actuating and control system comprising:

wheel speed sensors sensing wheel speed of each of said wheels and generating wheel speed signals corresponding to the wheel speeds of said wheels;

a master cylinder for generating wheel brake fluid actuating pressures when actuated and having a brake pedal input member adapted to be moved by the vehicle operator, said master cylinder comprising:

a housing having formed therein a plurality of pairs of brake fluid pressurizing chambers, each of said pairs formed by first and second chambers, each chamber having therein a brake fluid pressurizing piston movable in one direction to increase brake fluid actuating pressures and movable in an opposite direction to decrease brake fluid actuating pressures in said chambers, the first chamber of each of said pairs of chambers having a cross section area different from the cross section area of the second chamber of each of said pairs of chambers;

each of said pairs of chambers having a brake fluid actuating pressure outlet fluid connected to receive brake fluid pressure from said first and second chambers of each of said pairs of chambers, each of said brake fluid actuating pressure outlets being fluid connected to at least one of said wheel brakes so that each of said wheel brakes receives brake fluid actuating pressure from one of said pairs of chambers;

said brake pedal input member being connected to move said brake fluid pressurizing pistons in said first chambers to pressurize brake fluid in said first chambers and said brake fluid actuating pressure outlets;

a servomotor connected to each of said brake fluid pressurizing pistons in said second chambers to independently move said pistons in said second chambers and selectively increase, decrease or maintain the brake fluid actuating pressures in said brake fluid actuating pressure outlets;

means sensing the force exerted on said brake pedal input member by the vehicle operator when said brake pedal input member is urged in the brake actuating direction by force exerted by the vehicle operator, said sensing means generating a vehicle brake force demand signal;

accelerometer means generating a vehicle acceleration signal;

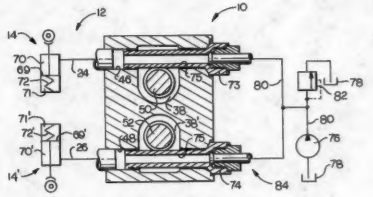
and a controller receiving each of said signals and independently controlling each of said servomotors to provide brake actuating pressure boost and to modify the brake actuating pressures delivered to appropriate ones of said wheel brakes by said master cylinder to control wheel lock of said wheels due to excessive brake actuation for the vehicle operating conditions at each wheel.

4,576,418

BRAKE RELEASE MECHANISM FOR VEHICLE TOWING

Charles E. Holzinger, Peoria, and David M. Fee, Groveland, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 13, 1984, Ser. No. 630,566
Int. Cl.[4] B60T *17/18*
U.S. Cl. 303—71 **11 Claims**



1. In a brake release mechanism adapted for use in a vehicle having a spring-applied, pressure-released brake, a primary source of pressurized fluid, a reservoir, and a brake valve having a housing and a valving element, said housing having a bore defined in the housing, an inlet port connected to said source, a work port connected to said brake, and a drain port connected to said reservoir, each of said ports intersecting the bore at axially spaced locations, and said valving element being selectively movable in said bore between a first position at which said work port is in open communication with said inlet port while being blocked from said drain port and a second position at which said work port is blocked from said inlet port while being in open communication with said drain port, the improvement comprising:

means for isolating said work port from said valving element and said drain port, said isolating means being adaptable to connect an alternate source of pressurized fluid to said brake so that said brake is released upon failure of said primary source.

4,576,419

VEHICLE ANTI-SKID OR ANTI-BRAKE-LOCK SYSTEM, AND BRAKE CONTROL METHOD

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,889
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313097
Int. Cl.[4] B60T *8/58, 8/64*
U.S. Cl. 303—100 **21 Claims**

1. In a vehicle anti-skid or anti-brake-lock system having

an electronic control unit (14, 60) receiving wheel speed signals, processing said wheel speed signals and providing brake pressure control signals for both wheels on the front axle of the vehicle and, separately, in a rear axle brake system (II) for both wheels of the rear axle of the vehicle,

and wherein the electronic control unit is operable, selectively, in a "select-low" control range and a "select-high" control range,

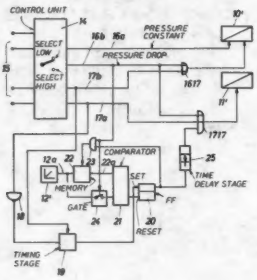
a method of controlling the brake pressure control signals, comprising, in accordance with the invention, the steps of

sensing (12; 57, 58) the braking pressure applied to the front wheels (50) of the vehicle and delivering a front wheel pressure signal;

applying said front wheel pressure signal to the electronic control unit;

generating, in the electronic control unit, pressure control signals to control the braking pressure of the rear wheels (51);

sensing if, in response to a tendency of the rear wheels to block or skid, the braking pressure in at least one of the rear wheels has dropped,



and, if so, providing a pressure drop signal;

controlling the pressure to said at least one rear wheel to have a value or level (P_{oHA}) which is below the pressure at which the tendency to block was sensed;

sensing if a controlled maximum pressure (P_{1VA}) at the front wheels (50) in a subsequent control cycle has increased above a maximum pressure (P_{oVA}) of the preceding cycle, and, if so, providing a comparison signal;

controlling the pressure in the rear wheel braking system at a steady or constant level until said comparison signal is received;

and then increasing the pressure in the rear wheel braking system (II).

4,576,420

LINEAR BEARING ARRANGEMENT FOR GUIDING A CARRIAGE IN A STRAIGHT LINE ALONG A GUIDE RAIL

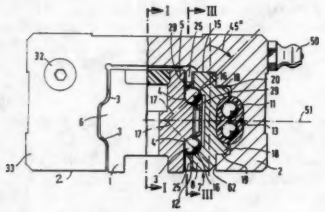
Wolfgang Lehmann, Stuttgart, and Hans-Walter Aab, Waiblingen, both of Fed. Rep. of Germany, assignors to Neff Gewindespindeln GmbH, Waldenbuch, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,207

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313129

Int. Cl.[4] F16C *29/06*

U.S. Cl. 308—6 C **28 Claims**



1. Linear bearing arrangement for guiding an elongated carriage (2) in a straight line along a guide rail (1), having an endless course of balls (3) disposed between the carriage and the guide rail, wherein

the guide rail (1) has at least one ball race (4) for rolling contact with load bearing balls of the ball course and

at least one longitudinal track element (7) is provided, having at least one load bearing ball race (16) and at least one diversion and return track (11, 11*a*) for unloaded balls secured to the elongated carriage (2), and

wherein

the carriage (2) comprises an essentially C-shaped structure which fits over and in part around and encompassing the guide rail (1);

the track element (7) comprises a subassembly including an elongated track carrier element (8) formed with the load bearing ball race or track (16) facing the ball race (4) on the rail (1),

and the diversion and return track includes a return track guide means (11, 11*a*) located remote from the load bearing ball race of the track (16);

a diversion track guide means (9, 10) located at each of the ends of the carrier element and diverting the balls from the load bearing ball race or track to the return track guide means;

and means (12, 11, 11*a*) for captively retaining the balls on the track carrier element including a return track ball return structure, extending longitudinally of the return track, said structure, at least in part, circumferentially surrounding the balls (3) in the subassembly;

wherein said track element subassembly (7) of the track carrier elements (8), the diversion track guide means (11, 11*a*) and the ball retention means (12, 11, 11*a*) is retained in the carriage structure; and

wherein the ball return structure comprises at least one pipe element.

4,576,421

LINEAR SLIDE BEARING

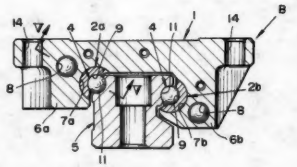
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,368

Claims priority, application Japan, Aug. 12, 1983, 58-146530

Int. Cl.[4] F16C *29/06*

U.S. Cl. 308—6 C **3 Claims**



1. A linear slide bearing comprising:

a bearing body having

two skirts which straddle a rail track along which said bearing body is adapted to reciprocate, one of said skirts transferring downward and horizontal loads to said track rail and the other of said skirts transferring upward and horizontal loads to said track rail;

a first race receiving groove formed in an inner surface of one of said skirts, said first race receiving groove having a substantially semicircular configuration in cross-section and opening obliquely in a downwardly facing direction;

a second race receiving groove formed in an inner surface of the other of said skirts, said second race receiving groove having a substantially semicircular configuration in cross-section and opening obliquely in an upwardly facing direction;

said two race receiving grooves permitting twisting of

said bearing body with respect to said track rail to allow preloading to said linear slide bearing;

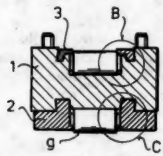
two bearing races, each fitted in a respective race receiving groove, each bearing race having a substantially semicylindrical configuration in cross-section with an outer configuration thereof conforming to the substantially semicircular configuration of the respective race receiving groove in which it is fit, each bearing race having an inner surface with a loaded ball groove positioned so as to face a corresponding ball rolling groove formed on said track rail, and the center of the outside diameter of each bearing race being substantially coincident with the center of a ball which bears a load between said loaded ball groove on the related bearing race and the corresponding ball rolling groove on said track rail.

4,576,422

ROLLER SHOE STRUCTURE

Fiák László; Derzsényi Sándor, and Darin Sándor, all of Debrecen, Hungary, assignors to Magyar Gordulocsapagy Muvek, Debrecen, Hungary

Filed Feb. 27, 1985, Ser. No. 705,971
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 308—6 C **3 Claims**



1. A roller shoe structure for high-accuracy straight-line guiding of construction units moving on each other comprising a main body with component parts forming straight-line sections of a self-recurrent closed roller guiding raceway, raceway sections reversing the motion of the rollers, and a train of load bearing roller elements with recirculation motion, characterized in that side-guide clamping grooves (z_1) and retaining insert clamping grooves (z_2) are shaped in the main body (1) for engaging said main body (1) with side-guides (2), which ensure a straight-line guiding of the rolling elements (5), and retaining inserts (3), which prevent said rolling elements from dropping out of the roller shoe structure if not built in, respectively, without using any binding element.

4,576,423

CABINET DRAWERS SECURITY LOCKING DEVICE

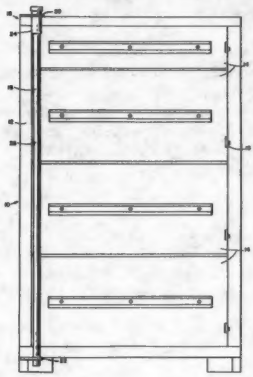
John G. Hendriks, 608 Martha, Decatur, Ala. 35601

Filed Oct. 4, 1984, Ser. No. 657,550
Int. Cl.⁴ E05B *65/46*
U.S. Cl. 312—216 **1 Claim**

1. A locking device for releasably securing a plurality of drawers in a cabinet, said locking device comprising:

a. a pair of upper and lower support brackets, said upper and lower support brackets respectively secured to upper and lower surfaces of said cabinet, said upper support bracket having a pair of semi-circular openings therein joined by a connecting slot having a width smaller than the diameters of said semi-circular openings, said lower bracket having a pair of spaced openings therein, said openings of said lower bracket having a smaller diameter than said semi-circular openings of said upper bracket; and,

b. a rod slidably supported in said brackets, said rod disposed for engagement with said drawers for retention thereof in secured relation, said rod being positioned in a first of said semi-circular openings of said upper bracket and a first of said pair of spaced openings of said lower bracket for secured relation of said drawers and movable to a second of said semi-circular openings of said upper bracket and a second of said pair of spaced openings of said lower bracket for release of said drawers, said rod having an



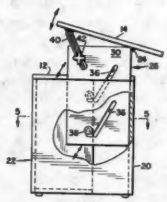
upper section provided with a diameter larger than the diameter of a lower section thereof, said lower section having a diameter smaller than said connecting slot of said upper bracket.

4,576,424

ARTIST'S WORK AND STORAGE STATION

John E. Nelson, Mountaintop, Pa., assignor to Eberhard Faber, Inc., Wilkes-Barre, Pa.

Filed Mar. 27, 1984, Ser. No. 593,834
Int. Cl.⁴ A47B *46/00*
U.S. Cl. 312—231 **6 Claims**



1. A drawing board and support assembly collapsible into a cabinet wherein the drawing board forms at least a part of the upper surface thereof comprising:

an outer support having upstanding front, rear and side walls;

inner support means including mutually spaced wall members disposed parallel to the side walls of the outer support and fixed at an edge thereof to the inner surface of the outer support;

U-shaped member slidably disposed within said outer support with the wall members received therewithin; the outer surface of each of said wall members being disposed adjacent the inner surface of a corresponding leg of said U, the base of said U being disposed parallel to the front wall of said outer support;

a drawing board hingedly attached to the upper surface of said U-shaped member at the base thereof;

releasable guide means for guidinig sliding movement of said U-shaped member and drawing board between a lowered position wherein said board is disposed in a horizontal position resting on at least a portion of the upper surface of said outer support, and a raised position wherein said board is

fixed in a position above the outer support with a portion thereof extending outwardly of the front wall of the outer support and the U-shaped member abuts a corresponding portion of the inner surface of the front wall of the outer support to lock said member against downward movement; and

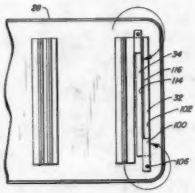
adjustment means connected between the U-shaped member and said drawing board for permitting rotation thereof about the hinge connection between a first position wherein the board is horizontal and a second position wherein the board is disposed at a predetermined angle to the horizontal, including lock means for releasably holding said board in a predetermined position.

4,576,425

FOOD SERVICE CART DOOR STRUCTURE

Curtis C. Pinnow, Libertyville, and Brian Gill, Mundelein, both of Ill., assignors to Carter-Hoffman Corporation, Mundelein, Ill.

Filed Mar. 5, 1984, Ser. No. 586,301
Int. Cl.[4] A47B 63/00
U.S. Cl. 312—324 6 Claims



1. In a food service cart having a cabinet with first and second oppositely facing sidewalls and a opening in each said sidewall, a tray storage area within the cabinet, and a flat endwall joining between the first and second sidewalls, improved structure for selectively sealing said opening and allowing unobstructed access to said tray storage area through said openings for inserting or removing trays comprising:

a first door having substantially flat, inside and outside wall surfaces, said inside wall surface extending at least partially across said opening of the first sidewall with the first door in a closed position;

first hinge means pivotally mounting the first door to the cabinet to pivot about a first pivot to an open position in which said outside wall surface of the first door is in parallel juxtaposition with the endwall;

a second door substantially similar to said first door and having substantially flat, inside and outside wall surfaces, each of said first and second doors having distal edges, said inside surface of the second door extending at least partially across said opening of the second sidewall with the second door in a closed position; and

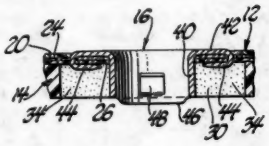
second hinge means pivotally mounting the second door to the cabinet to pivot about a second pivot, said second hinge having a length greater than said first hinge by substantially the thickness of said first door, the second door being disposed in an open position in overlapping relationship with the first door with the outside surface of the second door being in substantially parallel juxtaposition with the inside surface of the first door in the open position, said first pivot being spaced from the plane of said endwall approximately one-half the thickness of said first door and said second pivot being spaced from the plane of said endwall approximately the thickness of said first door plus approximately one-half the thickness of said second door, thereby disposing said distal edges of the doors in alignment at said opposite sidewalls when the doors are in the cloed position.

4,576,426

FLEXIBLE PRINTED CIRCUIT CONNECTOR AND CONTACT EYELET THEREFOR

Alan J. Herrmann, Brook Park, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1985, Ser. No. 721,997
Int. Cl.[4] H01R 9/07
U.S. Cl. 339—17 F 8 Claims



7. A contact eyelet for attaching a flexible printed circuit to a stabilizer plate or the like comprising;

a tubular body which has a flange at one end for engaging a surface of a flexible printed circuit,

a plurality of depending crimp ears at the rim of the flange for piercing through the flexible printed circuit and which are bendable inwardly for engaging an opposite surface of the flexible printed circuit to clamp the flexible printed circuit against the flange, and

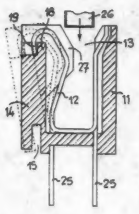
a second plurality of crimp ears at the opposite end of the tubular body which are bendable outwardly for engaging a stabilizer plate and clamping it between the second plurality of crimp ears and the flange.

4,576,427

ZERO INSERTION AND EXTRACTION FORCE CONNECTOR

Marcel Verbruggen, Londerzell, Belgium, assignor to Burndy Corporation, Norwalk, Conn.

Filed Nov. 26, 1980, Ser. No. 210,719
Claims priority, application Belgium, Nov. 30, 1979, 198361
Int. Cl.[4] H01R 9/09
U.S. Cl. 339—61 M 4 Claims



1. In a hand-actuated zero insertion and extraction force electrical connector having a molded one piece housing and at least one pair of resilient conductive contacts lodged within a channel of such housing, the improvement comprising:

said molded one piece housing having said elongated channel defined by opposing side walls and a base of said housing, one such side wall of said housing being substantially more flexible than the opposing side wall and adapted for hand actuation independant of a tool so as to engage one of the pair of the resilient contacts upon the displacement thereof, said one side wall having an integral abutment means which prevents excessive bending of said one side wall due to hand actuation to displace said one contact,

thereby effecting a corresponding displacement of said one resilient conductive contact within the elongated channel away from the opposing contact so as to permit insertion

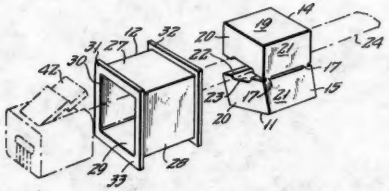
and/or extraction of a printed circuit within said channel with zero force.

4,576,428

PROTECTIVE BOOT FOR TELEPHONE SUBSCRIBER JACKS

Paul V. DeLuca, Plandome Manor, and Peter Hung, Huntington, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Oct. 29, 1984, Ser. No. 665,661
Int. Cl.⁴ H01R *4/00*
U.S. Cl. 339—94 R **4 Claims**



1. An improved protective boot for effecting a seal in the area of interconnection of a mutually engaged telephone subscriber jack and plug comprising: a first boot element of relatively thick cross-section including first and second abutting members adapted to surround a flat electrical conductor engaged with a rear end of said plug, said first boot element being of rectangular configuration; a second boot element of relatively thin cross section of generally rectangular configuration, and defining a recess corresponding in configuration to the outer configuration of said plug, said second boot element having a laterally extending peripheral flange surrounding an engaged plug when in installed condition, movement of said plug into engagement with said jack serving to distort said second boot element to effect a sealing action against a transversely extending surface of said jack surrounding a plug opening therein; said first and second boot elements in engaged condition being in juxtaposed relation to effect a seal in the area of interconnection between said conductor and said plug.

4,576,429

CONNECTION DEVICE FOR ELECTRIC CONDUCTOR

Pierre Hardouin, Asnieres; Felix Lameyre, Rueil Malmaison, and Claude Paris, Ermont, all of France, assignors to La Telemecanique Electrique, France

Filed Oct. 17, 1983, Ser. No. 542,844
Claims priority, application France, Oct. 15, 1982, 82 17256
Int. Cl.⁴ H01R *4/26*
U.S. Cl. 339—95 D **7 Claims**

1. A connecting device for at least one electric conductor, said device comprising:

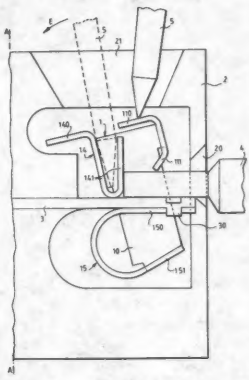
a housing provided with at least one first opening for passing said electric conductor therethrough in an introducing direction, and at least one second opening for introduction of a tool, said second opening having a first axis of symmetry;

a flat contact member fixedly mounted within said housing and extending in a first plane, said flat contact member having first and second opposite faces;

a one-piece made tilting member cooperating with said flat contact member for resiliently jamming the electric conductor, said tilting member comprising:

(i) a plane support part having first and second end portions respectively located on the respective sides of the flat contact member, said plane support part extending in a second plane adjacent to the flat contact member, said plane support member substantially extending at right angle to the first plane and parallel to said introducing direction;

(ii) a presser tongue part extending from said first end portion in a third plane making an acute angle with said first plane;



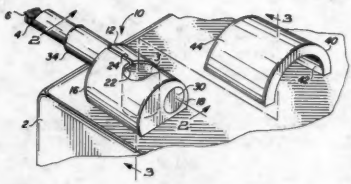
(iii) a resilient part extending from said second end portion at right angle thereto and bearing on said first face of the flat contact member, said resilient part acting on said plane support part in such a way that said presser tongue part will tend to come into abutment with said second face of the contact member for jamming the electric conductor.

4,576,430

SNAP CABLE CLAMP APPARATUS FOR BATTERY TERMINALS

Raymond A. Dufresne, 527 W. Townley, Phoenix, Ariz. 85021

Filed May 30, 1984, Ser. No. 615,287
Int. Cl.⁴ H01R *11/26, 11/11*
U.S. Cl. 339—100 **13 Claims**



1. Cable clamp apparatus for connecting an electrical cable to a terminal post, comprising, in combination:

dielectric block means, including

a dielectric block,

a bore in the dielectric block for receiving the terminal post, and

an expansion slot extending through the dielectric block,

a relieved portion communicating with the bore in the dielectric block for providing electrical contact with the terminal post,

means for electrically connecting the conductive block to the electrical cable, and

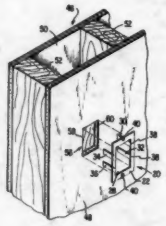
means for connecting a jumper cable to the conductive block including a jumper face on the conductive block; and

clamping means disposed on the dielectric block for securing the dielectric block to the terminal post.

4,576,431
FIXTURE FOR SECURING AN ELECTRICAL CONNECTOR

C. Kenneth Thayer, 11141 Georgia Ave., Silver Spring, Md. 20902

Filed May 1, 1985, Ser. No. 729,402
Int. Cl.[4] G04D 7/00; H01R 13/74
U.S. Cl. 339—131 9 Claims



1. A fixture for mounting an electrical connector element in an opening in a panel, the connector element having a plurality of openings to accommodate mounting screws, comprising:

a sheet metal element having

a substantially flat portion with an opening therein, said opening having first and second spaced-apart ends and first and second spaced-apart sides that are substantially parallel,

a plurality of first elongated legs joining said substantially flat portion at respective first bent regions that are disposed along said first side of said opening at first predetermined distances from said first end, each first leg being longer than half the distance between said first and second sides, and

a plurality of second elongated legs joining said substantially flat portion at respective second bent regions that are disposed along said second side of said opening at second predetermined distances from said first end, said second predetermined distances being different from said first predetermined distances to stagger said second legs with respect to said first legs so that said legs so that said legs alternate from a first leg to a second leg, for all of said legs, from one of said ends to the other of said ends, each second leg being longer than half the distance between said first and second sides; and

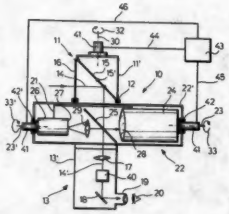
screw securing means disposed on said substantially flat portion for securing the mounting screws.

4,576,432
AIMING OR SIGHTING APPARATUS WITH SYNCHRONOUSLY ROTATING THERMAL IMAGER AND AIMING HEAD

Roderich Rüger, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 640,510
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329671
Int. Cl.[4] G02B 23/04, 23/08, 23/12
U.S. Cl. 350—1.2 6 Claims

1. An aiming or sighting apparatus for aiming at a target, comprising an aiming head (**11**) having a vertically extending axis (**30**), an ocular unit (**13**) and a display section (**22**), means mounting said aiming head for rotation normally around said vertically extending axis (**30**), means linking said ocular unit (**13**) with said display section (**22**), said aiming head (**11**) having a first housing (**11'**) with an inlet window (**16**) and a tiltable aiming mirror (**15**), said ocular unit (**13**) having a second housing (**13'**) and lens means (**17**), a deflection-mirror (**18**) and an ocular (**19**) in said second housing (**13'**), said display section (**22**) normally extending horizontally and having a third housing (**22'**), a beam splitter (**25**), a thermal imager (**24**) having a first horizontal axis (**23**), a cathode ray tube (**26**) having a screen (**27**) and a second horizontal axis (**23'**), and an optical lens (**29**) operatively arranged in said third housing, a cable (**21**) operatively connecting said thermal imager (**24**) to said cathode ray tube (**26**), and interconnected drive means (**41**) operatively connected to said aiming head (**11**) and to said

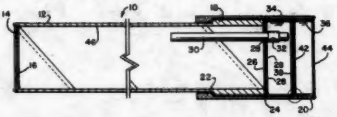


thermal imager (**24**) for rotating said aiming head and said thermal imager (**24**) in synchronism with each other about said vertically extending axis (**30**) and about said first horizontal axis (**23**) respectively, whereby an image with the target (**2**) and line structures (**3**) of a screen (**1**) are maintained in an original horizontal orientation on said screen (**27**) of said cathode ray tube (**26**) relative to an image received even after an azimuth rotation of said aiming head (**11**).

4,576,433
MEANS FOR CREATING RANDOM PATTERNS OF VARIEGATED LIGHT, AND LIGHT-REFLECTIVE MEANS THEREFOR

McKevin Shaughnessy, 359 Second St., Hoboken, N.J. 07030

Filed Jul. 5, 1984, Ser. No. 628,294
Int. Cl.[4] G02B 23/00
U.S. Cl. 350—4.1 17 Claims



1. Means for creating random patterns of variegated light, comprising:

a housing having opposite ends, with an end cap rotatably journalled on one of said ends;

a transparent window set in one of said ends;

a single, variegated object movably disposed within said housing intermediate said ends thereof; and

means confined within said housing, intermediate said object and said window, for (a) close-proximity scanning of said object, and (b) conducting variegated images of light from said object toward said window; wherein

said end cap has an annular surface therewithin which has a given inside diameter;

said object comprises a circular disc;

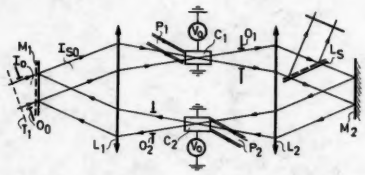
said object is confined within said annular surface; and

said object has an overall diameter of less than said given inside diameter and, consequently, freely rolls upon said annular surface coincident with rotation of said end cap.

4,576,434
DEVICE FOR RECORDING A COHERENT IMAGE IN A MULTIMODE OPTICAL CAVITY

Jean P. Huignard, Paris; Henri Rajbenbach, Montrouge; Brigitte Loiseaux, and Jean P. Herriau, both of Orsay, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 19, 1984, Ser. No. 652,034
Claims priority, application France, Sep. 23, 1983, 83 15156
Int. Cl.⁴ G03H *1/16, 1/28*
U.S. Cl. 350—3.64 **8 Claims**



1. A device for recording a coherent image in a multimode optical cavity, comprising a coherent source having a wavelength λ which generates a signal wave, optical guiding means for forming a closed loop in which the signal wave circulates, said guiding means being provided with focusing means, wherein said device further comprises two interactive amplifying media placed on the path of the signal wave within the cavity having terminals to which are applied respectively two voltages such that electric fields are in the direction 001 of each crystal, the coherent source being adapted to deliver in addition two reference beams which interfere with the signal wave in each of the two crystals so as to form two diffraction gratings and at least two shutters placed on the path of the signal wave within the cavity, each of said two interactive media being such as to have an optimum exponential gain coefficient, the angles θ_i formed between the signal wave and each reference beam being determined by the formula

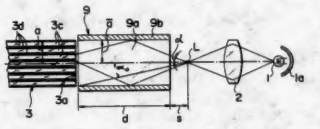
$$\Lambda_i = \frac{\lambda}{2 \sin \theta_i}$$

where Λ_i is the pitch of the strata within the medium considered, at least one phase modulator being placed on the path of one of the reference beams, said interactive media being placed in the vicinity of the Fourier plane of said cavity, a semitransparent plate being placed on the path of the signal wave in order to extract part of the energy of the multimode optical cavity.

4,576,435
ENDOSCOPE INCLUDING A REFLECTOR RELATED BY AN INEQUALITY FOR UNIFORM LIGHT DISTRIBUTION

Kimihiko Nishioka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jul. 14, 1983, Ser. No. 513,771
Claims priority, application Japan, Aug. 5, 1982, 57-136479
Int. Cl.⁴ G02B *23/26*
U.S. Cl. 350—96.26 **5 Claims**



1. A light transmitting device comprising: a light guide formed by a bundle of optical fibres, a light source, a condenser lens disposed between the source and an incident end of the light guide, and a pipe-shaped reflector disosed between the condenser lens and the incident end of the light guide such that light from said light source passes through the condenser lens, through the pipe-shaped reflector and then through the light guide, the pipe-shaped reflector satisfying the following inequality:

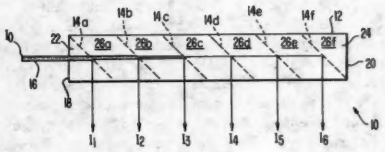
$$(-S+(d/n)) \tan \alpha > \bar{a}$$

where S representa a distance from the incident face of the pipe-shaped reflector to a point which is conjugate to the source with respect to the condenser lens, d the length of the reflector, n the refractive index of a portion of the reflector which allows the passage of light therethrough, $\bar{a}$ the radius of the portion of the reflector and α the minimum numerical aperture of a light flux which impinges upon the reflector.

4,576,436
LIGHT DISTRIBUTION AND COLLECTION ASSEMBLIES AND METHODS

Maurice Daniel, 550 Jaycox Rd., Avon Lake, Ohio 44012

Filed Jan. 31, 1983, Ser. No. 462,676
Int. Cl.⁴ G02B *5/172*
U.S. Cl. 350—96.10 **21 Claims**

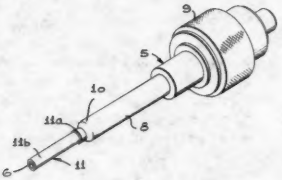


1. In a light distribution assembly for distributing light from a beam of light provided by a light source of the type comprising a light transmitting means for receiving light from said light source and transmitting said light along at least one path within said light transmitting means, and mirror means including a plurality of spaced, beam splitting mirror means positioned to intercept light travelling along said path, a group of said beam splitting mirror means each operating to deflect a portion of said light outwardly from said light transmitting means while permitting the remainder of said light to continue along said path the improvement for enabling said group of beam splitting mirror means operate to deflect light of substantially equal intensity outwardly from said light transmitting means wherein each beam splitting mirror means in said group of beam splitting mirror means is formed to provide a reflectivity which differs from that of the remaining beam splitting mirror means, the reflectivity of each said beam splitting mirror means progressively increasing as the distance of said mirror means from the light source increases and wherein said light transmitting means is a rod into which said mirror means are incorporated at equally spaced intervals in a manner such that said group of beam splitting mirrors collectively fill a length of said rod without adjacent mirror means overlapping, said rod having a length that corresponds to the width thereof multiplied by the number of said beam splitting mirror means.

4,576,437
CONNECTOR FOR FIBRE OPTIC CABLE

Yukitake Ohta, and Yasuo Fukunaga, both of Mooka, Japan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 1, 1982, Ser. No. 353,281
Claims priority, application Japan, Mar. 6, 1981, 56-30290[U]
Int. Cl.[4] G02B *6/36, 6/44*
U.S. Cl. 350—96.20 10 Claims



1. A connector for fiber optic cable having a fiber optic element, a fiber core surrounding said fiber element, reinforcing fibers arranged around the circumferential surface of the fiber core, and an outer cover disposed about said reinforcing fibers, said connector comprising:

a main elongate body having first and second ends and a first annular opening at said first end, said first annular opening being sized to just receive said fiber core of said cable;

a relatively thin insertion section for inserting into an end of said cable and extending forwardly of said main body, said insertion section having a diameter and cross-section smaller than said main body and a second annular opening sized to just receive said fiber core of said cable, the outer diameter of said insertion section being sized to be inserted between said fiber core and said reinforcing fibers; and

a brim on said insertion section adjacent said main body for limiting the length of insertion of said insertion section into said cable, the outside diameter of said brim being greater than the outside diameter of said insertion section but less than the outside diameter of said main body, said brim being adapted to contact an end of said outer cover of said cable through said reinforcing fibers to deflect said reinforcing fibers from said fiber core and to substantially evenly space said reinforcing fibers radially about said cable.

4,576,438
HEAT-RESISTING OPTICAL FIBER

Yoshiharu Tatsukami, Toyonaka; Yasuyuki Kato, Niihama, and Shigeo Wake, Saijo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

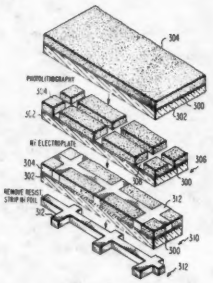
Filed Jun. 16, 1983, Ser. No. 504,861
Claims priority, application Japan, Jun. 17, 1982, 57-105069; Mar. 2, 1983, 58-34990; Mar. 7, 1983, 58-37741
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.34 10 Claims

1. A heat-resisting optical fiber comprising a core and a cladding, characterized in that the core is made of a polymer comprising 3 to 100% by weight of units of the methacrylic ester and 97 to 0% by weight of units of at least one member selected from the group consisting of C_1–C_6 alkyl acrylate and C_1–C_6 alkyl methacrylate, of which the ester moiety has an alicyclic hydrocarbon group of not less than 8 carbon atoms, and the cladding is made of a transparent polymeric material having a refractive index of at least 3% smaller than that of the core.

4,576,439
REFLECTIVE DIFFRACTIVE AUTHENTICATING DEVICE

Michael T. Gale, Wettswil; Karl H. Knop, Zurich, and Martin Ebnöther, Affoltern a. Albis, all of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 5, 1983, Ser. No. 520,824
Claims priority, application United Kingdom, Sep. 15, 1982, 8226232
Int. Cl.[4] G02B *5/18;* B32B *3/30*
U.S. Cl. 350—162.23 11 Claims



1. In an authenticating device for use in authenticating an item of sheet material when said device is bonded to said item; wherein said device comprises an integrated structure of a substrate layer and a transparent overcoat layer separated from one another by a coating layer that is situated in intimate contact with said substrate and overcoat layers at the interface therebetween, said interface including a reflective diffraction grating in the form of a relief pattern, said grating having specified grating-profile, physical-amplitude and line-period parameters that operate to separate polychromatic illuminating light incident thereon into at least one pair of light beams of contrasting colors, and wherein the bond of said coating layer to said respective substrate and overcoat layers at said interface is significantly less secure than is a direct bond of said substrate to said overcoat layer; the improvement wherein:

said coating layer is divided in at least one dimension into a set of separated regions, adjacent ones of said regions being separated from one another in at least one dimension by a spacing distance a, the center-to-center distance of adjacent ones of said regions in at least said one dimension being b;

the respective values of a and b being characterized in that b is on the order of ten times larger than a, a is significantly larger than the line-period of said diffraction grating, and b is sufficiently small as to be at most barely noticeable to the naked eye of an observer; and

said overcoat layer being directly bonded to said substrate layer within the separation between adjacent ones of said regions of said coating layer.

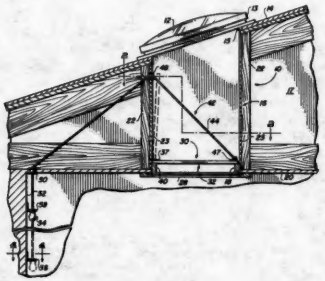
4,576,440
SKYLIGHT WITH A REMOTELY OPERABLE LIGHT INTENSITY REDUCING MECHANISM

Mark N. Worthington, 10227 White Mountain Rd., Sun City, Ariz. 85351

Filed Jan. 11, 1985, Ser. No. 690,631
Int. Cl.[4] G02B *17/00, 27/00*
U.S. Cl. 350—258 16 Claims

1. A light intensity reducing mechanism for use with a skylight structure of the type having a light shaft enclosure extending between a light admitting window mounted in a roof of a building and an opening formed in a ceiling of a room in the building, said light intensity reducing mechanism comprising:

(a) a sheet of translucent material for mounting in the light shaft enclosure of the skylight;
(b) an axle shaft defining an axis of rotation;
(c) means interconnecting said axle shaft and said sheet of translucent material;
(d) bearing means for rotatably journaling said axle shaft in the light shaft enclosure of the skylight for movement of said sheet of translucent material about the axis of rotation between a first full light passing position and a second reduced intensity light passing position;
(e) said axle shaft having one end which extends through the light shaft enclosure when installed therein;



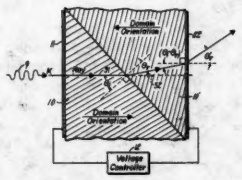
(f) a drive shaft for rotatable mounting on the exterior of the light shaft enclosure, said drive shaft having one end proximate said axle shaft but its opposite end located in an opening defined by a ceiling in a building in which the skylight is mounted when said drive shaft is mounted on the light shaft enclosure;
(g) gear drive means mounted on said axle shaft and on said drive shaft for coupling said axle shaft to said drive shaft;
(h) coupling means on the opposite end of said drive shaft; and
(i) tool means selectively connectable to said coupling means for rotatable driving of said drive shaft.

4,576,441

VARIABLE FRESNEL LENS DEVICE

Frederick Kubick, White Plains, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,815
Int. Cl.⁴ G02B *3/08, 27/44;* G02F *1/05*
U.S. Cl. 350—355 **10 Claims**



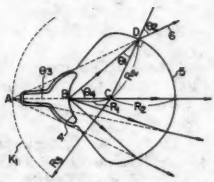
1. A device for focussing and defocussing a beam of radiation in the range of millimeter wavelength radiation, comprising:
first and second material media having adjoining complementary sides with Fresnel lens contours, each having a flat outer side as well, said media being birefringent and having coincident optic axes with opposing domain orientations, said axes being disposed in the direction of propagation of said beam of millimeter wavelength radiation;
a pair of electrodes adjoining said material media, said electrodes being orthogonal to said optic axes; and
electric means for providing a voltage between said pair of electrodes to establish a continuously changeable and reversible electric field across said media for controllably directing the focussing and defocussing activity of the device.

4,576,442

IMAGE PROJECTION APPARATUS

Masanori Oguino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,958
Claims priority, application Japan, Feb. 4, 1983, 58-16156
Int. Cl.⁴ G02B *1/06, 3/12*
U.S. Cl. 350—418 **2 Claims**



1. An image projection apparatus comprising:
a concave radiant plane for forming an original image, the radius of curvature of said concave radiant plane being one unit of length;
a transparent medium layer having a refractive index of n, where $n>1$;
a convex light exit plane having a radius of curvature of approximately n units of length, said convex light exit plane being placed forwardly in the normal direction of said radiant plane at a distance of approximately $(n+1)$ units of length therefrom;
said transparent medium layer filling substantially the space between said concave radiant plane and said convex exit plane; and
a vertex angle θ_3 of the diverging light emitted from said light exit plane being $\theta_3=\sin^{-1}(1/n^2)$.

4,576,443

ZOOM LENS WITH HIGH VARIABLE POWER RATIO INCLUDING WIDE-ANGLE CAPABILITY

Takayuki Itoh, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1983, Ser. No. 526,315
Claims priority, application Japan, Aug. 25, 1982, 57-147273
Int. Cl.⁴ G02B *15/14*
U.S. Cl. 350—427 **15 Claims**

1. A zoom lens with a high variable power ratio including wide-angle lens capability, comprising, in order from the object, a first lens unit having a positive focal length, a second lens unit having a negative focal length, and a third lens unit having a positive focal length, said first, second and third lens units being mechanically movable to change the overall focal length and keep an image plane constant, said third lens unit being composed of, in order from the object, a third sub-lens unit a having a positive lens, a negative lens and a positive lens

in order from the object and a third sub-lens unit b having a positive lens, a negative lens and a positive lens in order from the object, and said third lens unit meeting the following conditions:

$$0.25<f_{min}/f_I<0.65; \quad (1)$$

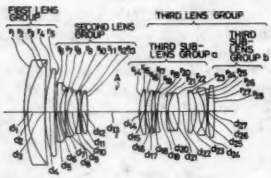
$$-1.25<f_{min}/f_{I\,II}<-0.7; \quad (2)$$

$$0.5<f_{min}/f_{I\sim IIIa}<1.0; \quad (3)$$

$$1.3<f_{min}/f_{I\sim IIIb}<2.1; \quad (4)$$

$$0.35<|r_{IIIbN}|/f_{min}<0.7; \text{ and } (r_{IIIbN}<0) \quad (5)$$

$$1.7<N_{IIIbN} \quad (6)$$



where

f_{min} is the minimum focal length of the overall system, f_I is the focal length of the first lens unit, $f_{I\,II}$ is the combined focal length of the first and second lens units at the minimum focal length,

$f_{I\sim IIIb}$ is the focal length of the first lens unit through third sub-lens unit at at the minimum focal length,

$f_{I\sim IIIb}$ is the focal length of the first lens unit through the positive lens, closer to the object, of the third sub-lens unit b at the minimum focal length,

r_{IIIbN} is the radius of curvature of a surface, closer to the object, of the negative lens of the third sub-lens unit b, and

N_{IIIbN} is the refractive index at d-line of the negative lens of the third sub-lens unit b.

4,576,444

MACRO-FOCUS ZOOM LENS

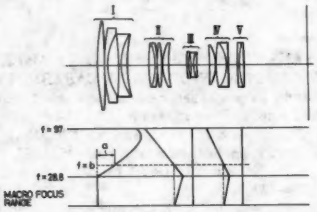
Atsushi Kawamura, Yokosuka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,357

Claims priority, application Japan, May 12, 1983, 58-81727

Int. Cl.⁴ G02B 9/36, 15/22

U.S. Cl. 350—428 **2 Claims**



1. A macro focusing zoom lens comprising:

a first lens group positioned near the object side and having a negative refractive power;

a second lens group positioned after said first lens group and having a positive refractive power;

a third lens group positioned after said second lens group and having a negative refractive power;

a fourth lens group positioned after said third lens group and having a positive refractive power;

a fifth lens group positioned after said fourth lens group and having a positive refractive power;

zooming means coupled to said lens groups for zooming from a telephoto side to a wide angle wherein said second and fourth lens groups are moved as a variator towards an image, and where said first lens group is moved as a compensator with said third and fifth lens groups being fixed and wherein a macro-zoom focusing is performed by said focusing means by movement of said second and fourth lens groups from the wide angle side of said lens towards the object side.

4,576,445

ZOOM LENS

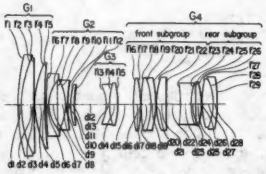
Kiyotaka Inadome, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed May 18, 1984, Ser. No. 612,069

Claims priority, application Japan, May 27, 1983, 58-93648; May 27, 1983, 58-93649

Int. Cl.⁴ G02B 9/36, 15/14

U.S. Cl. 350—427 **17 Claims**



1. A zoom lens having a change-magnification range ranging from wide angle to telephoto comprising, in succession from the object side:

a first lens group of positive refractive power movable on the optical axis;

a second lens group of negative refractive power fixed relative to the image plane at a predetermined position;

a third lens group of negative refractive power movable on the optical axis; and

a fourth lens group of positive refractive power movable on the optical axis,

said first and fourth lens groups being movable toward the object side in linear fashion to change magnification from the wide angle end to the telephoto end while said third lens group being movable toward the object side at the same time in non-linear fashion to keep the image plane at said determined position.

4,576,446

ZOOM LENS MOUNTING

Shigeru Kamata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,742

Claims priority, application Japan, Aug. 16, 1983, 58-148788

Int. Cl.⁴ G02B 7/10, 11/08

U.S. Cl. 350—429 **3 Claims**

1. A zoom lens mounting comprising:

(a) a first optical member having a focusing function and a zooming function and a first holder member;

(b) a second optical member cooperating with said first optical member and a second holder member;

(c) a body tube having first and second straight slots each elongated in a parallel direction to an optical axis;

(d) a stop member arranged to move axially when zooming is performed;

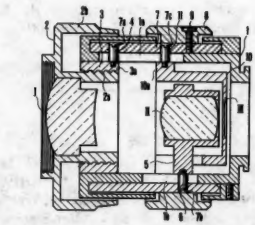
(e) a cam cyclinder,

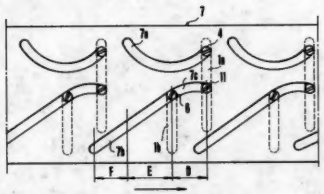
said cam cyclinder having first, second and third cam por-

tions for controlling the movements of said first and second optical members and said stop member, said first and third cam portions crossing said first straight slot and said second cam portions crossing said second straight slot; and

(f) cam follower means,

said cam follower means having guide pins fixedly secured





to said first and second optical members and said stop member,

said guide pins including a first guide pin engaging at a cross point of the first straight slot and the first cam portion,

a second guide pin engaging at a cross point of the second straight slot and the second cam portion, and

a third guide pin engaging at a cross point of said first straight slot and the third cam portion.

4,576,447

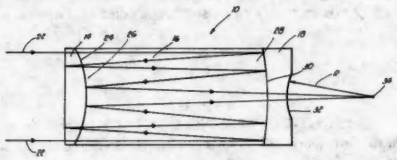
COMPACT, SINGLE PIECE LASER BEAM ANALYZER

Dietrich G. Korsch, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 26, 1983, Ser. No. 535,404

Int. Cl.⁴ G02B *17/00*

U.S. Cl. 350—444 **4 Claims**



1. A laser beam analyzer for measuring a laser light beam, the analyzer comprising:

a solid cylinder of glass, the cylinder having two internally convex and concave partially transmitting, partially reflecting spherical surfaces, a flat entrance surface for receiving the entire beam across the surface thereof and a concave spherical exit surface.

4,576,448

PHOTOGRAPHIC LENS SYSTEM FOR COMPACT CAMERAS

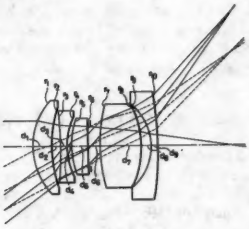
Kazuo Ikari, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,787

Claims priority, application Japan, Jun. 16, 1982, 57-102171; Oct. 28, 1982, 57-188181; Dec. 15, 1982, 57-218271

Int. Cl.⁴ G02B *9/60, 9/62*

U.S. Cl. 350—465 **21 Claims**



1. A photographic lens system comprising a front lens group and a rear lens group, said front lens group comprising a first, second and third lenses, said first lens being a positive meniscus lens arranged to be convex toward the object side, said second lens being a biconcave lens, said third lens being a positive lens, said rear lens group comprising a fourth and fifth lens, said fourth lens being a biconvex lens, said fifth lens being a negative meniscus lens arranged to be convex toward the image side, said photographic lens system being arranged to fulfill the condition (1) shown below:

$$0.15f < d_7 < 0.4f \quad (1)$$

where, reference symbol d_7 represents the thickness of the fourth lens, and reference symbol f represents the focal length of the lens system as a whole.

4,576,449

SIGHTING MIRROR INCLUDING A STABILIZING DEVICE

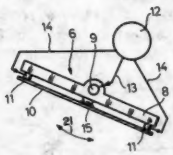
Roderich Rüger, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 14, 1984, Ser. No. 640,610

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332416

Int. Cl.⁴ G02B *27/64*

U.S. Cl. 350—500 **3 Claims**



1. A sighting mirror including a stabilizing device, comprising controllable drive means (**9**) for tilting said sighting mirror toward a target, mirror position adjustment means (**12**) for stabilizing a mirror position independently of operating conditions under which said sighting mirror is used, said mirror position adjustment means comprising a pivoted frame (**8**) for holding said sighting mirror in a roughly adjusted position in response to said controllable means (**9**), journal means (**15**)

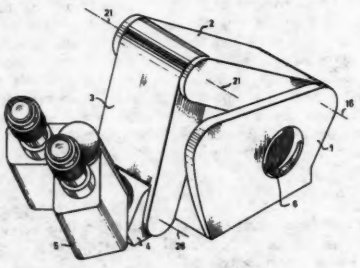
adjustably securing said sighting mirror to said pivoted frame, piezoelectric means operatively interposed between said pivoted frame and said sighting mirror for a fine adjustment of said sighting mirror relative to said frame, and wherein said mirror position adjustment means further comprise gyro means for providing electrical position control signals for said controllable drive means (9) and for said piezoelectric means, first conductor means (13) for electrically connecting said controllable drive means to said gyro means for a rough adjustment of said frame in response to said position control signals, and second conductor means (14) for electrically connecting said piezoelectric means to said gyro means for also energizing said piezoelectric means in response to said position control signals for said fine adjustment of said sighting mirror.

4,576,450

MICROSCOPE TUBE HAVING RELATIVELY SWINGING SECTIONS

Klaus Westphal, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 10, 1984, Ser. No. 579,161
Int. Cl.[4] G02B *21/00*
U.S. Cl. 350—522 **13 Claims**



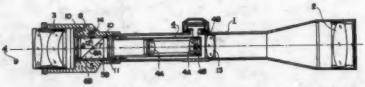
1. An articulated microscope tube including optical means for conducting an optical beam from a microscope objective to an eyepiece, said tube comprising a plurality of sections including a first section (1), a second section (2) mounted to swing relative to the first section about a first hinge axis (16), and at least one additional section (3) mounted on said second section to swing relative thereto about a second hinge axis (21) spaced from and parallel to said first hinge axis.

4,576,451

AIMING TELESCOPE

Katsuya Tominaga, Tokyo, Japan, assignor to Hakko Seiki Kabushiki Kaisha, Japan

Filed Dec. 20, 1982, Ser. No. 451,434
Claims priority, application Japan, Jan. 8, 1982, 57-1585[U]
Int. Cl.[4] G02B *23/10*
U.S. Cl. 350—566 **9 Claims**



1. An aiming telescope having an optical axis and comprising a pair of glass blocks having complementary surfaces cut at an angle of 45° and joined together;

each glass block having an end surface perpendicular to the optical axis and parallel to each other;

a reflective film having the shape of a reticle and centrally provided on at least one of said cut surfaces midway between said end surfaces to form an aiming pattern;

said glass blocks being cemented together along said complementary surfaces; and

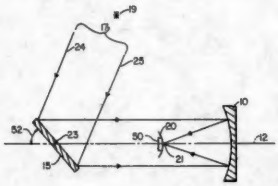
an illuminating means positioned so that light rays are transmitted through one of the glass blocks and reflected off the reflective film in the shape of a reticle to be visible through an occular system by a user and wherein the illuminating means is positioned so that the light rays incident to the reflective film are perpendicular to the optical axis.

4,576,452

REFLECTIVE SCHMIDT SYSTEM WITH NONROTATIONALLY SYMMETRIC CORRECTOR

Irving R. Abel, Lexington, and Marcus R. Hatch, Waltham, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 2, 1983, Ser. No. 500,462
Int. Cl.[4] G02B *5/10*
U.S. Cl. 350—620 **9 Claims**



1. An optical system for imaging energy from a desired scene of interest, said system having an optical axis and comprising:

A. a first substantially spherical concave mirror means positioned substantially about said optical axis;

B. an optical detection means located substantially at the position of best focus of said first spherical mirror means; and

C. corrector fold mirror means located substantially at the center of curvature of said first spherical mirror means substantially along or parallel to said optical axis, wherein said corrector fold mirror means is tilted relative to said optical axis in order to receive energy from said scene of interest and reflect said received energy substantially along said optical axis onto said first spherical mirror means, and wherein said corrector fold mirror means comprises nonrotationally symmetric deformations for the correction of optical aberrations of said optical system, said nonrotationally symmetric deformations thereby providing said corrector fold mirror means with substantially no symmetry of its surface around said optical axis.

4,576,453

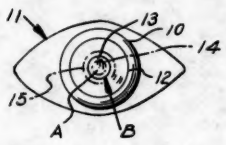
LIGHT-OCCLUDING CONTACT LENS

Richard Borowsky, 17 Amherst Ct., Rockville Centre, N.Y. 11570

Filed Aug. 3, 1984, Ser. No. 637,597
Int. Cl.[4] G02C *7/04, 7/10*
U.S. Cl. 351—162 **16 Claims**

1. A light-occluding contact lens having a shaded portion that has a progressive graded optical density whose gradation extends across the lens from a relatively darker center portion to a relatively lighter peripheral portion, and said gradation extending across the lens to a diameter between that of a di-

lated and contracted pupil of said lens wearer, said gradation adapted to vary optical density substantially imperceptibly to



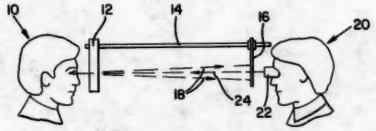
the wearer of said lens, whereby said lens is a benefit to lens wearers having a sensitivity to light.

4,576,454

EYE FATIGUE SIMULATOR FOR OPTOMETRY

Gregory S. Charney; Terrance D. Hohner, both of Portland, and Cosmo Salibello, Forest Grove, all of Oreg., assignors to Terrance D. Hohner, Portland, Oreg.

Filed Nov. 22, 1983, Ser. No. 555,036
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—243 **5 Claims**



1. A system for simulating the eye fatigue of a video display screen user and for determining the desired corrective lenses for that user comprising; a lens changing apparatus adapted to mount in front of a patient's eyes whereby different lenses can be selectively positioned into the patient's line of sight, a simulation device mounted in spaced relation to the lens changing apparatus and in the patient's line of sight, said simulation device having a viewing surface in the patient's line of sight surrounding a center opening through which the patient's eyes can be examined by an eye doctor, and images formed on the viewing surface adjacent said opening, said simulation device including a multilayer card-like member having a patient viewing side providing said viewing surface, a diffuser screen forming a layer of the member, an opaque coating forming a layer over the screen on the viewing side of the member, and said images provided by the discriminate removal of the opaque coating in the desired image areas to expose the underlying diffuser screen, and a light source on the opposite side of the member for projecting light through the diffuser screen in the image areas to project nonfocused images on said viewing surface simulating the images of a video display screen.

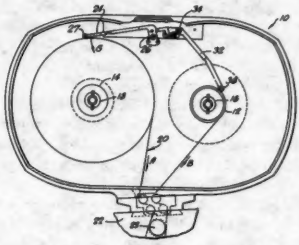
4,576,455

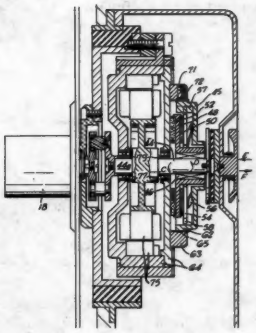
DUAL MOTOR REVERSIBLE DRIVE FILM MAGAZINE

Carl F. Fazekas, Tarzana, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Feb. 10, 1984, Ser. No. 578,890
Int. Cl.[4] G03B *23/02*
U.S. Cl. 352—78 R **21 Claims**

1. A film magazine comprising:
a supply hub adapted to support a supply reel of film;
a shaft adapted to couple with the supply hub;
a one way clutch adapted to couple with the shaft, the one way clutch adapted to permit free and independent rotation of the shaft relative to the one way clutch when the shaft is rotating in a first direction, the one way clutch adapted to rotate in response to shaft rotation when the shaft is rotating in a second direction opposite the first direction;





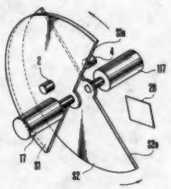
drag means for applying a torque to the one way clutch for causing resistance to the rotation of said shaft only in the second direction; and
motor means for driving the shaft in the first direction.

4,576,456

IMAGE SENSING SYSTEM

Tadashi Okino, Tokyo, and Syuichiro Saito, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,237
Claims priority, application Japan, Nov. 10, 1982, 57-196927
Int. Cl.[4] G03B *9/10*
U.S. Cl. 352—216 **7 Claims**



1. An image sensing system comprising:
image sensing means for sensing the image of an object to be photographed;
two shutter blades which block image light coming toward said image sensing means;
two rotative driving means for driving said two shutter blades respectively;
control means for controlling the difference in rotating

phase between said two rotative driving means to keep the difference unvarying;

wherein said control means includes detecting means for detecting the rotating phases of said two rotative driving means;

wherein said detecting means is arranged to detect a time at which the first shutter blade completes a light blocking action and to detect a time at which the second shutter blade commences a light blocking action;

wherein said control means includes a first signal generating means for producing a first signal which varies with the lapse of time after completion of the light blocking action and a second signal generating means for producing a second signal which varies with the lapse of time after the commencement of the light blocking action; and

wherein each of said first and second signal generating means includes a constant current circuit and a capacitor which stores electric charge of a current flowing from said constant current circuit.

4,576,457

MOTOR DRIVEN WINDING MECHANISM FOR CAMERA

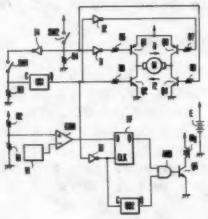
Tsuyoshi Fukuda, Kanagawa, and Yoshihiko Aihara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jan. 31, 1985, Ser. No. 696,741

Claims priority, application Japan, Feb. 3, 1984, 59-14829[U]

Int. Cl.⁴ G03B *1/18*

U.S. Cl. 354—173.11 **11 Claims**



1. A motor driven winding-up mechanism for a camera comprising:

(a) an electric motor;

(b) a drive circuit for rotating said motor in a winding-up direction;

(c) a film winding-up member;

(d) a transmitting and driving system for transmitting rotation of said motor to said film winding-up member;

(e) winding-up stopping means for stopping rotation of said motor and said transmitting and driving system each time a film has been wound up by a prescribed number of frames; and

(f) backward motion driving means for driving at least said transmitting and driving system to rotate to a few degrees of angle in the reversed direction to that in which it rotated when in winding at a time after the film has been wound up by the prescribed frame and before the initiation of the next film frame winding operation.

4,576,458

CAMERA FINDER EMPLOYING HOLOGRAPHIC VIEW FIELD FRAMES

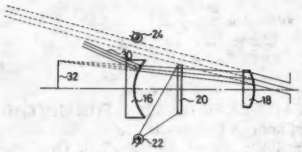
Michio Cho, Tokyo; Masane Suzuki, and Takayuki Saito, both of Oomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1984, Ser. No. 596,196

Claims priority, application Japan, Apr. 5, 1983, 58-59728; Dec. 1, 1983, 58-227542

Int. Cl.⁴ G03B *13/12, 13/14*

U.S. Cl. 354—199 **18 Claims**



1. In a camera comprising a camera body and a camera lens, said lens having a distance ring disposed thereon for focusing said lens, a camera finder comprising:

a finder optical system; a hologram provided in said finder optical system and having therein multiple-recorded at least two view field frames each corresponding to an object distance;

means for generating a plurality of reference beams; and

means for selecting one of said plurality of reference beams in accordance with the object distance, whereby one of said view field frames corresponding to the object distance is regenerated.

4,576,459

EYE-CUP FOR CAMERA

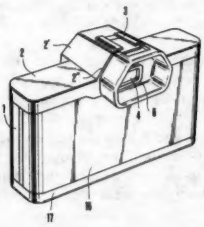
Yuzo Miura, and Akira Yamada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,471

Claims priority, application Japan, Jan. 31, 1983, 58-12560[U]

Int. Cl.⁴ G03B *11/04*

U.S. Cl. 354—287 **16 Claims**



1. An eye-cup for a camera having a projection formed on the contour for mounting viewfinder optics and a viewfinder, comprising:

an engagement part to be mounted in the neighborhood of the projection of the camera;

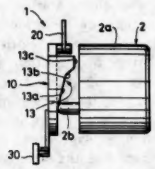
a see-through window for directing light from the eyepiece of the camera; and

an outer face part surrounding said see-through window so as to form a light shielding hood; said outer face part being formed so as not to protrude beyond the contour of said projection with at least a part of said outer face part being made to coincide with said contour of the projection of the camera.

4,576,460
PHOTOGRAPHING LENS POSITION DEVICE IN AUTOMATIC FOCUSING CAMERA

Koichi Daitoku, and Daiki Tsukahara, both of Kanagawa, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,397
Claims priority, application Japan, Oct. 28, 1983, 58-167132[U]
Int. Cl.[4] G03B 3/10
U.S. Cl. 354—400 5 Claims



1. A device for positioning a photographing lens to focus said lens on an object, which comprises:

distance detecting means for detecting a distance to an object to provide an output signal, said distance detecting means detecting said distance when said object is positioned in the range of ordinary photographing distances and in the range of distances shorter than said ordinary photographing distances;

position determining means for determining the position of said photographing lens in the direction of the optical axis according to said output signal; and

drive means for responding to (an output of) said position determining means, said drive means including cam mans which is displaced to move said photographing lens along the optical axis,

said cam means having a first displacement region for operating said photographing lens when said object is in the range of ordinary photographing distances, and a second displacement region for operating said photographing lens when said object is in the range of distances shorter than said ordinary photographing distances, said first and second displacement regions being so shaped that, with respect to an amount of displacement of said cam means the amount of movement of said photographing lens with said second displacement region is larger than that with said first displacement region.

4,576,461
SHEET HINGE FORMING APPARATUS

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

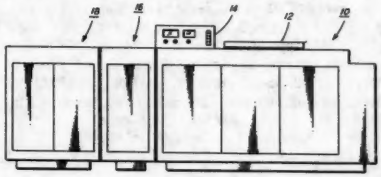
Filed Mar. 2, 1984, Ser. No. 585,466
Int. Cl.[4] G03G 21/00
U.S. Cl. 355—3 R 10 Claims

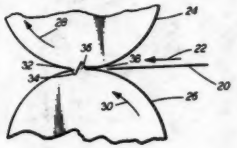
6. A printing system, including:

means for reproducing information on successive sheets;

means, in communication with said reproducing means, for forming a hinge in each sheet having information reproduced thereon said hinge forming means including means for advancing successive sheets in seriatim, and means, operatively associated with said advancing means, for reducing the stiffness of successive advancing sheets in a marginal region along a line substantially parallel to an edge of the sheet with the line of reduced stiffness for successive sheets being progressively offset from one another so as to facilitate bending of the sheets along the line of reduced stiffness; and

means, adapted to receive successive sheets from said forming means, for binding the sheets to form a booklet with the booklet opening at the hinge formed on each sheet and



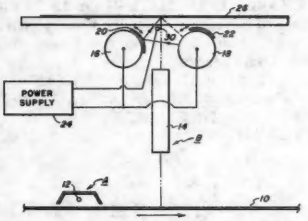


the sheets laying substantially flat with the booklet being opened.

4,576,462
ILLUMINATION SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING DEVICE

Richard F. Lehman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1984, Ser. No. 678,316
Int. Cl.[4] G03G 15/01
U.S. Cl. 355—14 R 3 Claims



1. A document imaging system including an illumination source for illuminating original documents having differing copyability requirements to be placed in an object plane, said illumination source comprising a first and second apertured lamp placed on opposite sides of a scan strip beneath said object plane,

said first lamp adapted to direct a band of light of a first spectral emission to said scan strip, said second lamp adapted to direct a band of light of a second spectral emission, complementory to said first emission to said scan strip,

a first and second faceted reflector associated with said first and second lamp respectively, said reflectors rotatably mounted and adapted to cover or uncover the aperture of said associated lamp in response to original document color conditions, and

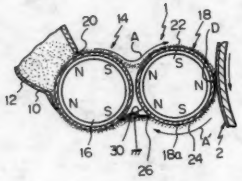
means for moving said reflectors into and out of an operative position in response to said document copyability requirements.

4,576,463

DEVELOPING APPARATUS FOR ELECTROSTATIC PHOTOGRAPHY

Koji Sakamoto, and Kazuo Kobayashi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 326,098, Nov. 30, 1981, Pat. No. 4,445,771.
This application Apr. 23, 1984, Ser. No. 603,260
Claims priority, application Japan, Dec. 5, 1980, 55-170846; Dec. 12, 1980, 55-174610; Dec. 30, 1980, 55-185726
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 21 Claims



1. An electrostatographic apparatus including a photoconductive member and means for forming an electrostatic image on the photoconductive member, constituted by comprising:

applicator means having an electrically insulative surface adapted to electrostatically adhere a toner thereto, the insulative surface being movable relative to the photoconductive member for applying the toner thereto for developing the electrostatic image into a toner image;

removal means for removing residual toner from the insulative surface after said development; and

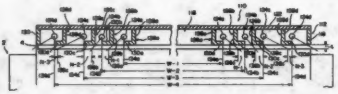
discharging means for electrically discharging the insulative surface after removal of the residual toner.

4,576,464

CHARGE ELIMINATING LAMP DEVICE

Hiromi Sakata, Neyagawa; Nobuhiko Kozuka, Suita, and Hiroshi Hiraoka, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1984, Ser. No. 682,763
Claims priority, application Japan, Dec. 28, 1983, 58-245438
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 19 Claims



1. A charge eliminating lamp device comprising a light shielding frame member positioned in proximity to at least one side portion of the surface of an electrostatographic material from which an electric charge is to be eliminated, said frame member having a light transmission opening at that surface which faces the surface of the electrostatographic material, a plurality of illuminating lamps adapted to be selectively energized and disposed within said frame member in spaced-apart relationship in the width direction of the electrostatographic material, and a plurality of inside edge restricting light shielding walls within said frame member, said inside edge restricting light shielding walls being positioned adjacent to the insides of said illuminating lamps respectively as viewed in said width direction and adapted to restrict the inside edges, in said width direction, of light-irradiated areas formed on the electrostatographic material by said illuminating lamps; wherein

each said inside edge restricting light shielding wall restricts the outside edge, in said width direction, of a light-irradiated area formed on the electrostatographic material by an illuminating lamp located inwardly of said inside edge restricting light shielding wall as viewed in said width direction to a site inwardly of the inside edge, in said width direction, of a light-irradiated area formed on the electrostatographic material by an illuminating lamp located outwardly of said inside edge restricting light shielding wall, and

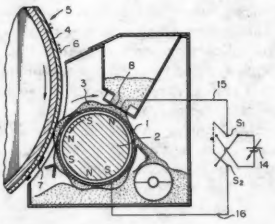
selctively energizable auxiliary lamps are disposed among said illuminating lamps in said width direction for irradiating an area on the electrostatographic material which ranges from its inside edge positioned between the inside edge and outside edge, in said width direction, of a light-irradiated area formed on the electrostatographic material by an illuminating lamp located inwardly of each said inside edge restricting light shielding wall in said width direction to its outside edge positioned at, or outwardly of, the inside edge, in said width direction, of a light-irradiated area formed on the electrostatographic material by an illuminating lamp located outwardly of said inside edge restricting light shielding wall in said width direction.

4,576,465

METHOD AND APPARATUS FOR ADJUSTING TONER CONCENTRATION OF TWO-COMPONENT TYPE DEVELOPER

Akira Fushida, Suita; Yuuji Hasegawa, Kishiwada, and Toshikazu Matsui, Nishinomiya, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 26, 1983, Ser. No. 535,637
Claims priority, application Japan, Sep. 24, 1982, 57-165062
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD 6 Claims



1. An apparatus for adjusting the toner concentration in a two-component type developer, which comprises a mechanism for forming a magnetic brush comprising a mixture of a magnetic carrier and an electroscopic toner and delivering said magnetic brush, said mechanism including a support formed of an electroconductive non-magnetic material and a magnet having a plurality of poles and being built in the interior of the support, at least one of said support and magnet being movable, mesh screen which is formed of an electroconductive material and arranged to support the electroscopic toner on the upper surface side thereof and to have sliding contact with the magnetic brush on the lower surface side thereof, and a bias voltage applying mechanism for applying a bias voltage between said support and mesh screen, and adjusting means for adjusting the polarity and intensity of the bias voltage to set a standard toner concentration of the magnetic brush, said standard toner concentration being defined as the toner concentration where the moving quantity of the toner through the mesh screen is substantially zero, wherein the toner concentration of the magnetic brush is adjusted by moving the toner toward the magnetic brush side through apertures of the mesh screen when the toner concentration is lower than the standard toner concen-

tration and by moving the toner toward the opposite side when the toner concentration is higher than the standard toner concentration.

4,576,466

DEVELOPING SYSTEM FOR AN ELECTROSTATIC COPYING APPARATUS

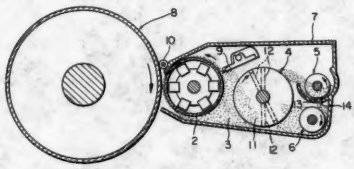
Masakazu Fukuchi, Hachioji, and Keiji Oishi, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,016

Claims priority, application Japan, Mar. 24, 1982, 57-46999

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. In an electrostatic copying apparatus, a developing system comprising a developing means including means defining an area to be developed, and means for supplying developers which include toners to said area to be developed, the improvement comprising:

a primary conveyance means in communication with supplying means for conveying said developers comprising at least toners in one direction with respect to the width of said area to be developed;

a secondary conveyance means arranged substantially under said primary conveyance means for receiving said developers from said primary conveyance means and for conveying said received developers in a direction opposite to the conveyance direction of said primary conveyance means;

a receptacle having a plurality of holes therein, said receptacle being arranged under said primary conveyance means and interposed between said primary and secondary conveyance means for receiving conveyed developers from said primary conveyance means and dropping said received developers through said holes to said secondary conveyance means, said holes being spaced along the conveyance direction of said developers;

said primary and secondary conveyance means having different conveyance capacities; and

agitating means arranged between said second conveyance means and said developing means, said agitating means including means for scooping up developers and causing scooped up developers to fly onto the primary conveyance means to mix with developers supplied from said supplying means.

4,576,467

LIQUID DEVELOPING APPARATUS

Masahiro Yamasaki, Otsu; Iwao Hirose, Hikone; Masao Fukushima, Echi, and Ichiro Yoshida, Shizuoka, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

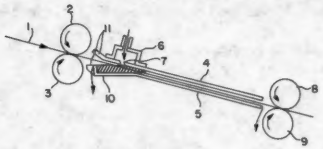
Filed Jun. 7, 1984, Ser. No. 618,188

Claims priority, application Japan, Jun. 27, 1983, 58-116709

Int. Cl.⁴ G03G *15/10*

U.S. Cl. 355—10 **5 Claims**

1. A liquid developing apparatus designed for electrophotography comprising a main electrode and an auxiliary electrode whose opposed surfaces define a passage for a photosensitive sheet having a latent image on its front surface which is to be developed by contact with a developing solution liquid, means for passing the photosensitive sheet through the passage with its front surface proximate the main electrode, means for filling the passage with liquid and characterized in that the surface of at least one of the electrodes defining the passage is



rough and coated with a resin film containing an electroconductive component.

4,576,468

CLEANING APPARATUS OF ELECTROPHOTOGRAPHIC COPYING MACHINE

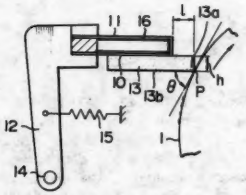
Kinzi Saito, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,397

Claims priority, application Japan, May 12, 1983, 58-81633; Jun. 10, 1983, 58-102730

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—15 **4 Claims**



1. A cleaning apparatus of an electrophotographic copying machine for cleaning a photoconductor drum of the electrophotographic copying machine comprising:

a pair of parallel elastic plates, one end portion of said elastic plates being integrally connected to each other, and the other end portion of said elastic plates being fixed to an arm member which is urged towards said photoconductor drum, and

a cleaning blade member which is fixed to one of said elastic plates, with a free end portion of said cleaning blade member projecting from said one elastic plate toward the surface of said photoconductor drum and being in pressure contact with the surface of said photoconductor drum with a predetermined pressure, and the angle between the upstream side of said cleaning blade in terms of the rotation of said photoconductor drum and the tangent at the contact point of said blade with the surface of said photoconductor drum is less than $\pi/2$.

4,576,469

SENSITIVE MATERIAL CUTTING AND TRANSPORTING MECHANISM

Koji Shiga, and Tatsunari Arito, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd. and Fuji Micro Graphics Co., Ltd., both of Kanagawa, Japan

Filed Jan. 25, 1984, Ser. No. 573,755

Claims priority, application Japan, Jan. 25, 1983, 58-10236

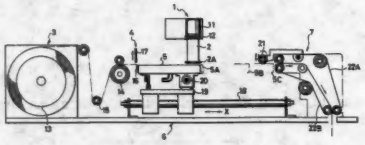
Int. Cl.⁴ G03B *29/00*

U.S. Cl. 355—29 **7 Claims**

1. A mechanism for cutting and transporting segments of material cut from an elongated web of material comprising:

(i) means for supplying said material;

(ii) means for feeding segments of said web of a predetermined length;
(iii) cutter means for cutting said segments from said web into cut segments;
(iv) a take-out section for receiving said cut segments of said web;
(v) suction and transporting means for receiving said cut



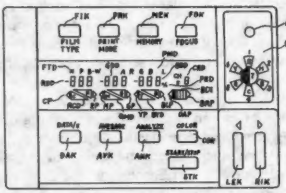
segments of said web supplied from said feeding means, said suction and transporting means being horizontally reciprocably mounted to be selectively reciprocal between a position adjacent said cutter means and a position adjacent said take-out section; and
(vi) means for selectively reciprocating said suction and transporting means between said cutter means and said take-out section.

4,576,470

ENLARGER FOR USE IN PHOTOGRAPHY

Yoshio Yuasa, Kawachinagano; Hidetoshi Yasumoto, Tondabayashi; Kazuhiko Naruse, Nabari; Nobukazu Kawagoe, Sakai, and Masahito Inaba, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1983, Ser. No. 532,717
Claims priority, application Japan, Sep. 16, 1982, 57-161754
Int. Cl.[4] G03B *27/80*
U.S. Cl. 355—38 **22 Claims**



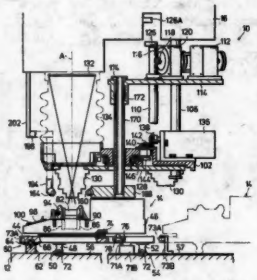
1. An enlarger for use in photography capable of printing a color copy from a color original film comprising:
means for providing a plurality of exposure data corresponding to a plurality of primary colors;
means for designating at least one of the primary colors;
means for altering the exposure data corresponding to the designated primary color;
means for displaying information relating to the exposure data to be altered;
means for indicating the direction of change in tone of the color copy caused by altering the exposure data;
means for selecting between a negative type and a positive type of original film; and means responsive to said selecting means for controlling the relation between the direction of change in tone of the color copy indicated by said indicating means and the direction of change in the exposure data displayed by said displaying means.

4,576,471

PHOTOGRAPHIC PRINTING APPARATUS

Mikio Kogane, and Mizuho Nishimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1985, Ser. No. 718,055
Claims priority, application Japan, Mar. 30, 1984, 59-64803
Int. Cl.[4] G03B *27/48, 27/50*
U.S. Cl. 355—50 **21 Claims**



1. A photographic printing apparatus which prints the images of a negative film onto photographic paper, comprising;
(a) a negative film carrier for successively guiding an intermediate portion of a negative film of continuous length on a printing light axis, said negative film carrier being capable of retracting from said printing light axis;
(b) a light receiver disposed such as to oppose said printing light axis of said negative film carrier;
(c) an optical system movable onto said printing light axis; and
(d) lifting guide means which permits said light receiver and said optical system to move in directions in which they come toward and away from said negative film carrier independently of each other and moves both said light receiver and said optical system in a direction in which they separate from said negative film carrier when said negative film carrier is retracted, whereby the retraction of said negative film carrier from said printing light axis is facilitated.

4,576,472

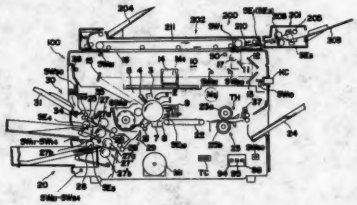
CONTROL APPARATUS FOR COPYING MACHINE

Masazumi Ito, Toyohashi, and Tomoji Murata, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 30, 1984, Ser. No. 666,368
Claims priority, application Japan, Nov. 5, 1983, 58-208134; Mar. 1, 1984, 59-40216
Int. Cl.[4] G03B *27/48*
U.S. Cl. 355—50 **3 Claims**

1. In a copying machine to which an automatic document feeder is attachable, a control apparatus therefor comprising:
first means for providing an input of an operation starting means for initiating a copying operation wherein said operation starting means is provided in said copying machine;
second means for determining that a document to be copied is placed at a document supporting table of the copying machine;
third means for determining whether said automatic document feeder is at a set position or at an open position relative to said document supporting table of the copying machine;
fourth means for determining that a document to be copied is set in said automatic document feeder for feeding onto said document supporting table; and

control means responsive to said operation starting means for starting copying operation of the copying machine when the document is determined to be placed at said document supporting table but without operating said automatic document feeder, and for operating said automatic document feeder for feeding the document onto the document supporting table to thereby effect the copying operation when the

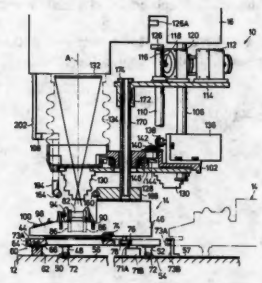


document to be copied is determined to be set at said automatic document feeder but not at said document supporting table, and for preventing operations of both of said copying machine and automatic document feeder when the document to be copied is determined to be not at the document supporting table as well as at the automatic document feeder.

4,576,473
PHOTOGRAPHIC PRINTING APPARATUS

Mikio Kogane; Mizuho Nishimura, and Takashi Yamamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1985, Ser. No. 718,121
Claims priority, application Japan, May 4, 1984, 59-89732; May 4, 1984, 59-89733; May 4, 1984, 59-89734
Int. Cl.⁴ G03B *27/74, 27/80*
U.S. Cl. 355—68 **20 Claims**



1. A photographic printing apparatus in which a plurality of optical systems are successively disposed on a printing light axis to thereby cope with a change in magnification during a printing operation, comprising:

(a) rotating means having said optical systems arranged about the center of rotation thereof to permit said optical systems to successively coincide with said printing light axis;

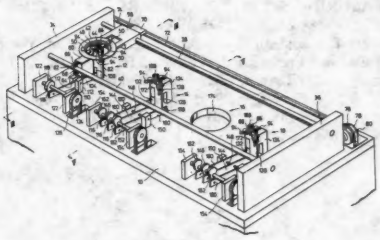
(b) an inner light receiver disposed inside the moving locus of said optical systems about the center of rotation thereof to effect photometry in relation to a negative film on said printing light axis; and

(c) an outer light receiver disposed outside the moving locus of said optical systems about the center of rotation thereof to effect photometry in relation to the negative film on said printing light axis, whereby a space for movement of said optical systems is provided between said inner and outer light receivers, thereby facilitating the operation of changing said optical systems one with another.

4,576,474
INFORMATION INPUT/OUTPUT APPARATUS FOR DISK FILM

Atsushi Shiraishi, and Mizuho Nishimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 9, 1984, Ser. No. 669,718
Claims priority, application Japan, Nov. 28, 1983, 58-223755; Nov. 28, 1983, 58-223756; Nov. 28, 1983, 58-223757
Int. Cl.⁴ G03B *27/62*
U.S. Cl. 355—75 **34 Claims**



1. An information input/output apparatus for a disk film used for effecting inputting and outputting of information in relation to the disk film in which a film disk is attached around a hub, said apparatus comprising:

(a) a hollow moving table on which the peripheral edge of said disk film is mounted;

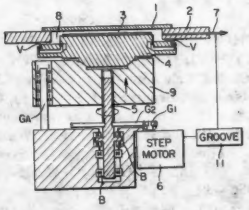
(b) retainer means which retains the peripheral edge of said disk film on said moving table; and

(c) guide means which moves said moving table to predetermined stations, whereby it is possible to simultaneously project all the image frames of said film disk in a projecting operation at a predetermined station.

4,576,475
CONTACTING METHOD AND APPARATUS IN CONTACT COPYING

Takahiro Kitagawa, Yokohama, and Masao Totsuka, Ohmiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 480,829, Mar. 31, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 756,568
Claims priority, application Japan, Apr. 5, 1982, 57-56322
Int. Cl.⁴ G03B *27/20, 27/02*
U.S. Cl. 355—91 **2 Claims**



1. A method of bringing a mask and a wafer into intimate contact, said method comprising the steps of:

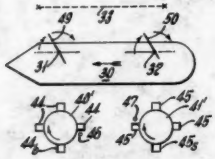
holding a marginal portion of the mask on a mask holder;
holding a wafer on a wafer chuck;
locating the mask holder and the wafer chuck so that the mask and wafer are out of contact;
exhausting gas from between the mask and the wafer while substantially preventing relative movement between the mask holder and the wafer chuck and concurrently permitting atmospheric pressure to act on a surface of the mask at its side opposite to the wafer thereby to cause the mask to become convex relative to the wafer; and
thereafter moving the mask holder and the wafer chuck relative to each other thereby to bring the mask and the wafer into intimate contact with each other.

4,576,476

METHOD AND SYSTEM FOR ACCURATELY MEASURING SPEED OF A SHIP RELATIVE TO A BODY OF WATER

Hubert T. Marshall, II, Fishkill; Eugene W. Vest, Wappingers Falls, and Frederick J. Villforth, III, Fishkill, all of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,994
Int. Cl.⁴ G01P *3/36*; G01C *21/00*
U.S. Cl. 356—28 **3 Claims**



1. Method of measuring the speed of a ship relative to a body of water through which said ship is being propelled, comprising the steps of
launching a free floating buoy near the front of said ship,
tracking said buoy with sighting scopes from two locations spaced apart a predetermined distance along the length of said ship,
said tracking comprising rotation said scopes in azimuth and in elevation while training them upon said buoy,
timing the relative movement of said buoy from the beginning to the end of said predetermined distance,
said step of timing comprising commencing a timed interval when the forward sighting scope has been rotated to reach a predetermined azimuth angle relative to the centerline of said ship, and
terminating said timed interval when the after sighting scope has been rotated to reach said same predetermined azimuth angle,
said speed being determined by dividing said predetermined distance by said time of the relative movements.

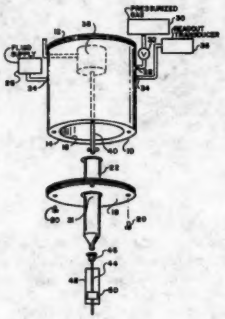
4,576,477

METHOD AND APPARATUS FOR MEASURING DENSITY PROFILES IN MICROSCOPIC TUBE FLOW

Aaron B. Corbet, Palo Alto, Calif.; Christoph Holliger, Boniswil, Switzerland, and Bruno Strul, Palo Alto, Calif., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 22, 1982, Ser. No. 390,876
Int. Cl.⁴ G01N *33/48, 21/05*
U.S. Cl. 356—39 **23 Claims**

1. Apparatus for use in determining the density profile of a flowing concentrated suspension test fluid, said apparatus comprising:
a transparent capillary tube;
means for flowing said concentrated suspsension test fluid vertically downward through said capillary tube;
light microscope means for transmitting light through said capillary tube and said flowing concentrated suspension test fluid in a horizontal direction perpendicular to the flow direction of said concentrated suspension test fluid, said microscope means comprising an array of photodiodes and means for focusing on said array an image of the



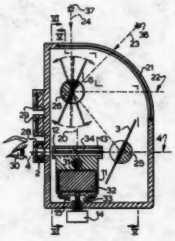
concentrated suspension test fluid flowing through said capillary tube and said transmitted light;
wherein said array of photodiodes is a horizontal linear array which extends to a greater length than the horizontal dimension of said test fluid image focused on said array; and
data acquisition and display means responsive to said photodiodes for displaying density profile information for said concentrated suspension test fluid.

4,576,478

OPTICAL INSTRUMENT FOR MEASURING ANGLES

Edwin J. Cohen, 20 Moreland Ct., Lyndale Ave., London NW2, England

Filed Aug. 24, 1982, Ser. No. 410,949
Claims priority, application United Kingdom, Sep. 11, 1981, 8127492
Int. Cl.⁴ G01C *1/10*
U.S. Cl. 356—149 **1 Claim**



1. An optical instrument for measuring angles, comprising:
support means defining an enclosure;
an eye piece mounted externally on the support means;
a first reflector mounted internally of the support means in alignment with a horizontal axis of the eye piece;
an adjustment member pivotally mounted externally on the support means;
a movable reflector mounted on the adjustment member and disposed internally of the support means in an orientation so as to face toward the first reflector, the support means

having a window intersecting lines of sight extending from the movable reflector;

measuring means for measuring pivotal movement of the adjustment member;

pendulum means mounted internally of the support means and located between the eye piece and the first reflector for pendulous movement in a swinging plane extending in the same direction as the axis of the eye piece;

and means for temporarily locking the pendulum in its lowermost, rest position relative to the support means,

said pendulum having first and second pairs of sight guide pins attached thereto at spaced locations along a guide axis which lies coincident with the axis of the eye piece when the pendulum is in its lowermost, rest position, each pair of sight guide pins including two pins spaced from the guide axis on opposite sides thereof and aligned axially with one another perpendicular to the guide axis,

whereby each of said pairs of guide pins aligns horizontally with the axis of the eye piece when the pendulum is in its lowermost, rest position.

4,576,479

APPARATUS AND METHOD FOR INVESTIGATION OF A SURFACE

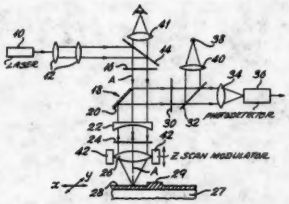
Michael J. Downs, 'Karibu', Furze Hill Road, Headley Down, Hampshire, England

Filed May 16, 1983, Ser. No. 495,129

Claims priority, application United Kingdom, May 17, 1982, 8214256

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—351 **8 Claims**



1. Apparatus for investigating the properties of a surface comprising means for generating a collimated beam of radiation having components of equal amplitude in two orthogonal directions of polarisation, birefringent focusing means for focusing radiation in two directions of polarisation at different positions along the optical axis of the apparatus, axial scanning means for altering said positions with respect to the surface under investigation and phase-sensitive detector means to receive radiation from the surface and comparator means to compare corresponding parameters of radiation received from the surface in each of said two orthogonal directions of polarisation.

4,576,480

OPTICAL ALIGNMENT SYSTEM

Alan J. B. Travis, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

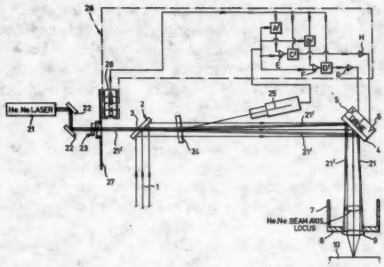
Filed Jul. 18, 1983, Ser. No. 514,594

Claims priority, application United Kingdom, Jul. 26, 1982, 8221520

Int. Cl.[4] G01B 11/26; B23K 9/00

U.S. Cl. 356—152 **10 Claims**

1. An optical alignment system comprising means for projecting an alignment beam of radiation along a path which forms part of an optical system including a mobile element having an alignment aperture, means for causing the alignment beam to scan around the periphery of the alignment aperture, means for receiving light returned from the periphery of the alignment aperture and producing an electrical signal related to the intensity thereof, means for determining the amplitude and phase of the electrical signal relative to those of the motion of the alignment beam around the periphery of the alignment



aperture and producing an alignment signal, and a servo mechanism adapted to respond to the alignment signal so as to bring the axis of the motion of the alignment beam and the center of the alignment aperture into coincidence.

4,576,481

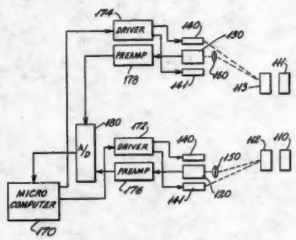
PASSIVE OPTICAL POSITION MEASUREMENT SYSTEM

Per K. Hansen, Burlington, Vt., assignor to Position Orientation Systems, Ltd., S. Burlington, Vt.

Filed Dec. 13, 1982, Ser. No. 449,235

Int. Cl.[4] G01B 7/03

U.S. Cl. 356—375 **11 Claims**



1. A passive optical position measurement system for determining and displaying the position of an object within a three-dimensional work area comprising:

(a) at least two position sensing detectors positioned a predetermined spaced distance apart from one another and positioned in substantially a common plane substantially adjacent to the periphery of said work area;

(b) first reflecting means located within said work area and adapted to be attached to a first object, the position of which is to be detected;

(c) second reflecting means located within said work area and adapted to be attached to a second object, the position of which is to be detected;

(d) light source means positioned adjacent each position sensing detector, said light source means including distinct light sources, each generating a distinct different light wavelength, the number of distinct light sources corresponding to the number of objects;

(e) each reflecting means including distinct filter means positioned in front of the reflective portion, each filter means allowing light therethrough with only one of said

wavelengths and each said filter means corresponding to a wavelength different from all other filter means;

(f) means controlling said position sensing detectors and light source means whereby said light source means may be activated to emit light therefrom, said controlling means sequentially pulsing said light sources of distinct different wavelengths, said light from each respective said light source means reflecting from said reflecting means directly back to the position sensing detector adjacent to the respective said light source means and said controlling means receiving signals from said position sensing detectors to calculate and display the position of said first and second objects in three dimensions;

(g) a further light source means generating light at a distanct wavelength from the wavelengths of said light sources corresponding to said objects; said further light source means each being positioned adjacent a position sensing detector; and

(h) said controlling means pulsing said further light source means and including means for interpreting signals received by said position sensing detectors from said further light source means to allow compensation for scattering objects within said work area, the position of which is not desired to be detected and displayed.

4,576,482

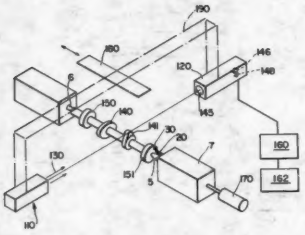
ELECTRO-OPTICAL INSPECTION

Timothy R. Pryor, Ontario, Canada, assignor to Diffracto Ltd., Canada

Continuation of Ser. No. 73,226, Sep. 7, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,614

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 356—376 **70 Claims**



1. Apparatus for determining a dimension of an object to an accuracy of at least ±0.0004 inches comprising:

an electro-optical sensor unit for sensing the positon of a portion of an object, said sensor unit comprising:

light source means for illuminating an edge of said portion of an object; lens means for forming an image of the illuminated edge of an object; a photosensitive array comprising a plurality of light sensitive elements capable of producing a signal in response to light incident thereon, said array being positioned to receive the image of an illuminated edge of an object;

electronic means for magnifying the resolution provided by said photosensitive array to a fraction of an individual light sensitive element, said electronic means including means for producing a fractional distance signal having a value indicative of the fractional distance between adjacent light sensitive elements; and

means for analyzing the signals from said light sensitive elements and said fractional distance signal to determine a dimension of said portion of said object to an accuracy of at least 0.0004 inches.

4,576,483

APPARATUS FOR MIXING AND METERING FLOWABLE SOLID MATERIALS

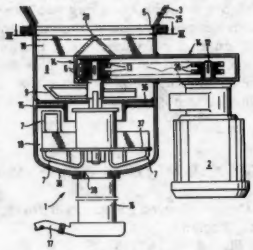
Paul Mathis; Bernhard Mathis; Franz Mathis, all of Merdingen, and Wilhelm Zimmerer, Münstertal, all of Fed. Rep. of Germany, assignors to Mathis System-Technik GmbH, Neuenburg, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,431

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326247

Int. Cl.⁴ B28C *5/08*

U.S. Cl. 366—65 **41 Claims**



1. A mixing and metering apparatus for flowable solid materials, such as building materials, fertilizers, mixtures of two or more flowable solid ingredients and the like, comprising a source of supply of flowable material, said source having a lower portion and an outlet in said lower portion; and a mixing unit for the material which issues by way of said outlet, said unit having a first mixing chamber receiving flowable material from said outlet, first mixing means including at least one mobile first mixing tool in said chamber, a second mixing chamber arranged to receive material from said first chamber, a vertical drive shaft at a level below said outlet, second mixing means including at least one second mixing tool disposed in said second chamber and receiving motion from said shaft, a prime mover for said shaft, said prime mover including a motor disposed laterally of said shaft, and transmission means connecting said motor with said shaft; and an at least substantially closed case for said transmission means, said case including a portion extending into said unit.

4,576,484

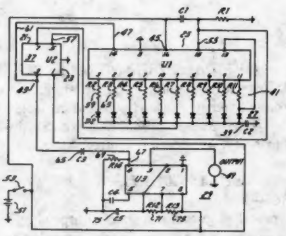
MEMORY ENHANCING APPARATUS

Mark C. Grossmeyer, N49 W6757 Western Rd., Cedarburg, Wis. 53012

Filed Jul. 5, 1984, Ser. No. 628,169

Int. Cl.⁴ G04B *23/02*

U.S. Cl. 368—245 **9 Claims**



1. Memory enhancing apparatus including:

a solid state oscillating section for generating a plurality of sequentially occurring first signals, each of said first sig-

nals having a frequency different from that of the immediately preceding signal;

a solid state frequency counting section for receiving said plurality of first signals and responsively generating a plurality of sequentially occurring second signals having a duration substantially identical one to the other, each sequential pair of said second signals being spaced by time intervals of differing durations;

a solid state dividing section coupled to said counting section and including means for determining the frequencies of said first signals;

an output section coupled to said counting section for providing a sequence of reminding signals, each of said reminding signals being in response to one of said second signals, said remining signals being of equivalent duration and of equivalent pitch one to the other, and;

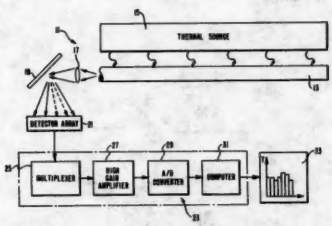
a switch coupled to said counting section, said oscillating section, said dividing section and said output section and operable by a user for actuating said apparatus, said apparatus automatically and indefinitely emitting a plurality of reminding signals upon actuation of said switch, the time of occurrence of said reminding signals being independent of the actual time, said reminding signals being initiated relatively soon after actuation by said user, said signals having a substantially constant volume.

4,576,485

METHOD AND APPARATUS FOR MEASURING TEMPERATURE PROFILE WITH A SINGLE OPTICAL FIBER

James L. Lambert, Shaler, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 490,262, Apr. 29, 1983, abandoned.
This application May 28, 1985, Ser. No. 738,517
Int. Cl.[4] G01J 5/08
U.S. Cl. 374—130 10 Claims



1. A temperature monitoring apparatus for determining a temperature profile along a single optical fiber comprising:

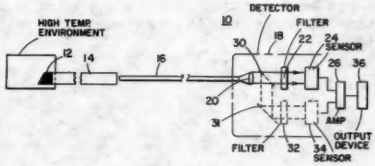
an optical fiber capable of internally generating a thermal radiation output in response to an ambient temperature proximate said fiber, said fiber characterized by a discrete absorption value for each wavelength of a spectral power density of the thermal radiation which absorption value for each wavelength is constant along the length of said fiber, and means for measuring the spectral power density of the internally generated thermal radiation operably associated with one end of said optical fiber, said means for measuring the spectral power density including means for separating the thermal radiation output into a predetermined number of spectral bandwidths wherein the output power of each spectral bandwidth is analyzed to provide the spectral power density of a plurality of individual spectral bandwidths wherein a temperature distribution along at least a part of the length of the optical fiber is reflected by the spectral content of the output radiation.

4,576,486

OPTICAL FIBER THERMOMETER

Ray R. Dils, Vancouver, Wash., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 23, 1983, Ser. No. 525,771
Int. Cl.[4] G01J 5/08, 9/00
U.S. Cl. 374—131 17 Claims



1. A temperature measuring device comprising:

(a) an elongated high temperature optical fiber,

(b) one end of said high temperature fiber having an optically dense film covering the outer surface thereof, thereby defining a region of the covered end of said fiber exhibiting blackbody radiation behavior, said blackbody region and said high temperature fiber able to measure temperatures in the range of 500°–2400° C., said blackbody region having a length to diameter ratio in the range 1/1 to 20/1,

(c) said blackbody region emitting radiation primarily in the range of 0.3 μm–1.0 μm within said temperature range of 500°–2400° C.,

(d) said high temperature fiber having a diameter in the range of 0.025 mm to 2.5 mm and transmitting radiation in said temperature range without substantial absorption thereof,

(e) a low temperature fiber having a different diameter than said high temperature fiber and coupled to the other end of said high temperature fiber,

(f) a light detector coupled to receive light transmitted by said low temperature fiber and including a narrow-band filter for selecting a narrow optical band wherein relatively small changes in temperature within said band result in relatively large changes in intensity emitted by said blackbody region, said narrow optical band within said 0.3 μm–1.0 μm range, said light detector providing an output signal proportional to the intensity of said received light, and

(g) means responsive to said output signal for providing an indication of said temperature measurement.

4,576,487

THERMALLY RESPONSIVE ELECTRICAL CONTROL DEVICE AND MONITORING CIRCUIT THEREFOR

Gilbert Conover, Jr., Providence, and Gary R. Richard, West Greenwich, both of R.I., assignors to Independent Energy, Inc., East Greenwich, R.I.

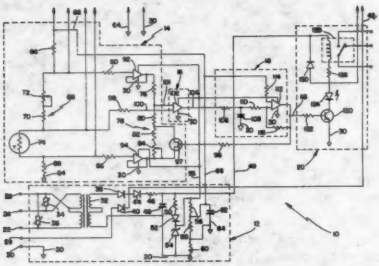
Filed Jan. 23, 1984, Ser. No. 573,047
Int. Cl.[4] G01K 7/00
U.S. Cl. 374—183 5 Claims

1. A thermally responsive electrical control device for producing an electrical signal having first and second voltage levels for controlling the operation of a system actuating device for first and second operating modes thereof, respectively, said control device comprising:

(a) a DC power supply circuit;

(b) a thermally responsive bridge circuit powered by said power supply circuit, said bridge circuit having first, second, third and fourth resistance elements, said first resistance element comprising a thermistor, said second resistance element residing on the same side of said bridge circuit as said first resistance element and comprising a

variable resistance element which is manually adjustable for varying the resistance thereof over a predetermined resistance range, the degree of manual movement required for varying the resistance of said second resistance element corresponding in a substantially linear relation over substantially said entire resistance range thereof to the degree of temperature change required for varying the resistance of said thermistor over a corresponding resistance range of said thermistor in order to match said second resistance element to said thermistor, said bridge circuit being operative for producing a first electrical signal having a voltage which is related to the ratio of the



resistance of said first resistance element to the resistance of said second resistance element and a second electrical signal which is related to the ratio of the resistance of said third resistance element to the resistance of said fourth resistance element; and

(c) a comparator circuit for comparing said first signal voltage to said second signal voltage and for producing an electrical control signal having a voltage which is substantially equal to said first voltage level when said first signal voltage is greater than said second signal voltage, and a voltage which is substantially equal to said second voltage level when said second signal voltage is greater than said first signal voltage.

4,576,488

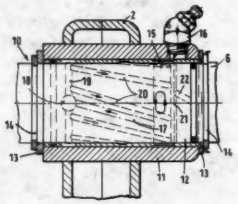
BEARING BUSHING

Helmut Steiner; Wilfried Ebbinghaus, both of Wiehl, and Hartmut Paech, Waldbröl, all of Fed. Rep. of Germany, assignors to Bergische Achsenfabrik Fr. Kotz & Söhne, Wiehl, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,094

Claims priority, application Fed. Rep. of Germany, Int. Cl.[4] F16C *33/10*

U.S. Cl. 384—291 **8 Claims**



1. A bearing bushing for a journal bearing of a brake shaft of a drum brake, said bearing bushing having an inside and an outside, and two ends; the bearing bushing further comprises:

a circumferential, annular grease recess disposed in the outside of said bearing bushing at one end thereof for receiving grease;

distributing channels disposed in the outside of said bearing bushing and extending essentially in the axial direction thereof; each of said distributing channels communicates with said grease recess and extends toward the other end of said bearing bushing;

respective holes in said bearing bushing; each of said holes communicates with one of said distributing channels, and is disposed at that end thereof remote from said grease recess;

a circumferential, first annular channel disposed in the inside of said bearing bushing at that end thereof remote from said grease recess; said first annular channel interconnects all of said holes;

lubricating channels disposed in the inside of said bearing bushing and extending parallel to, and between, said distributing channels; said lubricating channels communicate with said first annular channel between said holes;

a circumferential, second annular channel disposed in the inside of said bearing bushing at that end thereof remote from said holes and said first annular channel, at that end where said grease recess is provided; said lubricating channels also communicate with said second annular channel; and

at least one outlet channel provided in said bearing bushing and communicating with said second annular channel.

4,576,489

SYSTEM FOR THE CONTINUOUS LUBRICATION OF A ROLLING BEARING

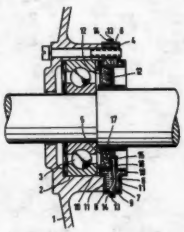
Benedikt Bentele, Hohenroth, and Manfred Heerlein, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,643

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1983, 3324075

Int. Cl.[4] F16C *33/66*

U.S. Cl. 384—469 **2 Claims**



1. In a system for the continuous lubrication of a rolling bearing arranged in a bearing bore provided at a bearing bracket, which comprises a reservoir containing a supply of lubricating oil and at least one wick leading from this reservoir containing a supply of lubricating oil being suppliable to the bearing through said wick, the improvement wherein:

at least one oilproof cavity filled with oil is formed in a separate bearing cover attachable on the bearing bracket and covering the bearing bore;

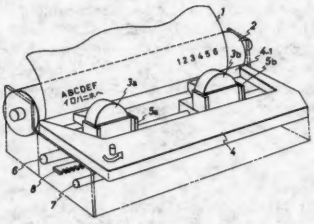
a felt ring is located between the bearing cover and the rolling bearing, contacting the rolling bearing and communicating with the wick; and

said bearing cover further comprises two interconnectable cover halves having depressions extending in axial and circumferential directions, said depressions being opposite each other after the two halves have been fitted together.

4,576,490
MULTIHEAD SERIAL PRINTER

Minoru Isobe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,904
Claims priority, application Japan, Dec. 14, 1983, 58-234311; May 14, 1984, 59-88376
Int. Cl.[4] B41J *3/44, 3/58, 3/04*
U.S. Cl. 400—82 **5 Claims**

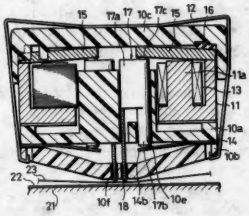


1. A multihead serial printer comprising a plurality of printing heads mounted on a plurality of different carriages, means defining a high-speed printing mode in which a plurality of printing heads print different letters, means defining a high-density printing mode in which a plurality of printing heads print different parts of one letter, and means for changing over between said high-speed printing mode and said high-density printing mode, wherein said plurality of carriages are independently supported by a common guide, each of said carriages has mounted thereon a printing head and is respectively movable in a letter spacing direction by a different and independent driving motor, and at least one carriage comprises a shift mechanism for independently moving a printing head mounted thereon along a surface of a platen in a paper feed direction a selectable distance relative to said other carriage before its driving motor moves the carriage in said letter spacing direction said selectable movement in the paper feed direction enabling either printing of a single letter by both print heads in the high density mode or printing of two lines simultaneously in the high speed mode.

4,576,491
PRINTING HEAD

Hiroshi Mishio, Morioka, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 21, 1984, Ser. No. 622,848
Claims priority, application Japan, Jun. 21, 1983, 58-95481[U]; Oct. 20, 1983, 58-162298[U]
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **5 Claims**

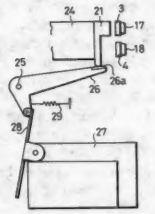


1. A printing head for printing on a recording medium by impacts from the ends of linear printing wires comprising a casing defining a plurality of linear passageways arranged around a central axis, respective depressing members axially linearly movable within each of said passageways and having integral therewith centrally extending portions carrying the ends of the respective printing wires for purely linear movement, means including a resilient member for urging said depressing members in a first direction within said casing, and means including a plurality of electromagnets arranged around said passageways and magnetic armatures each contacting an end portion of a respective depressing member for selectively moving said depressing members linearly in a second direction within said passageways for projecting the other ends of selective printing wires out from said casing by linear movement thereof, and wherein the axes of said linear printing wires moved by the depressing members are located nearer to said central axis of said printing head than the axes of said depressing members.

4,576,492
MULTI-STAGE PRINTER

Fukuo Sugawara, Yokohama; Yasuhiko Iwane, Morioka; Fumihisa Hori, and Takashi Onozato, both of Tamayama, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 23, 1983, Ser. No. 554,604
Claims priority, application Japan, Nov. 24, 1982, 57-204531
Int. Cl.[4] B41J *9/12, 11/36, 19/76, 27/08*
U.S. Cl. 400—146 **9 Claims**



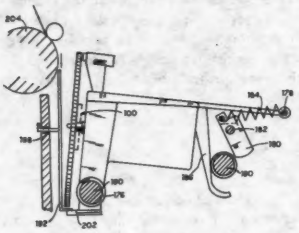
1. In a multi-stage printer having paper moving means for moving a printing paper along a paper moving direction, a plurality of type belts including at least an upper and a lower type belt spaced apart in successive stages along said paper moving direction, each type belt having a group of types arranged thereon, means for selecting one of said plurality of type belts for printing at a line position, successive line positions being spaced apart by an inter-line pitch on said paper, hammer means for pushing out type from said selected belt to effect a desired printing operation on the paper at a line position in front of the selected belt, hammer moving means for moving said hammer means to a printing position with respect to a selected one of said plurality of type belts, and type belt moving means for moving the types on a selected belt to the printing position to be pushed out by said hammer means for printing selected characters,

the improvement comprising control means connected to said paper moving means for advancing the paper to a visually confirmable position above said belts after printing from a first selected one of said belts at a first line position on the paper, and subsequently computing a paper moving amount and moving said paper by said computed paper moving amount for printing from a next selected one of said plurality type of belts at a second line position spaced from the first line position by said inter-line pitch, wherein said computed paper moving amount is the distance from the visually confirmable position to the second line position subtracted from the inter-line pitch, said computed paper moving amount is a variable depending upon which of the plurality of type belts is selected for printing at each of said first and second line positions.

4,576,493
LOCKING ASSEMBLY FOR PRINT WHEEL

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Ziyad Incorporated, Denville, N.J.

Filed Sep. 20, 1983, Ser. No. 534,128
Int. Cl.[4] B41J *1/60*
U.S. Cl. 400—175 **6 Claims**

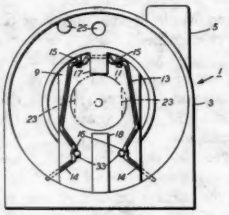


1. A carriage assembly including a print element for use in a printing device, said printing device having advancing means for advancing a sheet of paper past said carriage assembly to effect printing thereon by said print element, said carriage assembly comprising support means for supporting said print element adjacent said advancing means, said support means arranged within said printing device for tilting said print element away from said advancing means, and biasing means in operative association with said printing device for biasing said support means towards said advancing means when said print element is tilted away from said advancing means and when said printing device is operated, to thereby cause said print element to return to a position adjacent said advancing means to effect printing on a sheet of paper, said biasing means including gripping means for gripping said printing device to maintain said biasing means in a vertical orientation upon tilting of said mechanism away from said advancing means.

4,576,494
PRINT WHEEL CARTRIDGE

Henry E. Smith, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 559,540, Dec. 8, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 726,916
Int. Cl.[4] B41J *1/04*
U.S. Cl. 400—175 **1 Claim**



1. A printwheel cartridge for use in a printer having a carriage including printwheel release means thereon, said cartridge comprising:

a printwheel having a hub, and a pair of substantially parallel flat portions on said hub, said printwheel being housed within said cartridge for protection during handling and for being rotationally oriented for usage,

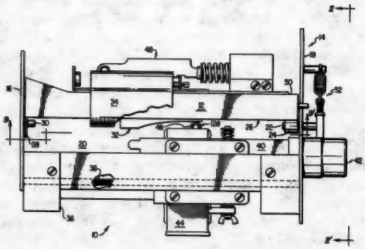
a pair of opposed abutment means each having a driving face for acting on said hub, one abutment means drives said printwheel in one direction insertion and the other abutment means drives said printwheel in a direction opposite to said one direction during removal of said cartridge from said carriage, the distance between the driving faces of said abutment means being slightly greater than the diameter of said hub for allowing free rotation of said printwheel within said cartridge during operation of said printer, and

spring retaining means having a pair of arms biased radially toward said printwheel hub for engaging said flat portions to prevent rotation of said printwheel, said arms extending substantially parallel to said one direction for allowing said cartridge to slide relative to said printwheel in order that the driving faces of said abutment means may engage said hub, and each of said spring arms includes detent means for receiving said printwheel release means for moving said arms away from said hub to free said printwheel for rotation within said cartridge.

4,576,495
DEPOSITORY/PRINTER MECHANISM FOR AN AUTOMATED TELLER MACHINE

Thomas G. Fulbright, Keller, and G. Houson Payne, III, Carrollton, both of Tex., assignors to Docutel/Olivetti Corporation, Irving, Tex.

Filed May 10, 1984, Ser. No. 608,970
Int. Cl.[4] E05G *3/00*; B41J *19/20*
U.S. Cl. 400—328 **18 Claims**



1. A depository/printer mechanism for an automated teller machine (ATM) having a depository bin, comprising:

an envelope tray means for receiving a customer envelope to be deposited in the depository bin;

a support assembly means for supporting said envelope tray means for rotation between a horizontal position and a vertical position;

a printer frame secured to said support assembly means and including a lead screw;

a printer carriage having a motor means for reciprocating said printer carriage on said lead screw between a first position and a second position, and from said second position back to said first position, said printer carriage further including:

a printer means having a printwheel for printing indicia on said envelope; and

drive means connected to said motor means for driving said printwheel against said envelope as said printer carriage reciprocates on said lead screw between said first and second positions; and

means supported by the printer carriage and the envelope tray means for rotating said envelope tray means from said horizontal position to said vertical position to thereby deposit the customer envelope in the depository bin as said motor means drives said printer carriage from said second position back to said first position following printing of said indicia.

4,576,496

DEVICE FOR GUIDING A PRINT ELEMENT

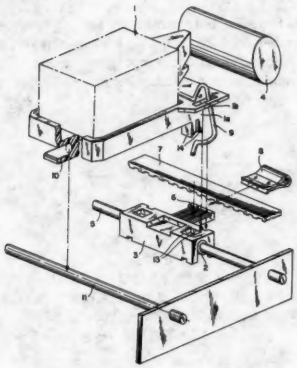
Helmut Schwarz, Dachau, and Heinz Stickel, Groebenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 586,986

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313205

Int. Cl.[4] B41J *19/00, 11/22*

U.S. Cl. 400—352 9 Claims



1. Apparatus for guiding a print head parallel to and facing a platen, comprising:

first and second guide rails extending parallel to the platen;

a fork-shape guide projection on the print head for receiving said first guide rail, said guide projection pivotal about and slidably movable along said first guide rail;

a guide bushing slidably mounted on and movable along said second guide rail;

a support mount seating said guide bushing therein;

connecting means for connecting said support mount to a traction device;

first latching means for accurately positioning the print head with respect to said support mount including first latching elements carried on the print head and second latch elements carried on said support mount, said first and second latch elements engaging when aligned and the print head is pivoted towards said support mount; and

second latching means carried by the print head and releasably engageable with said guide bushing.

4,576,497

EASEL TYPE RING BINDER CONSTRUCTION

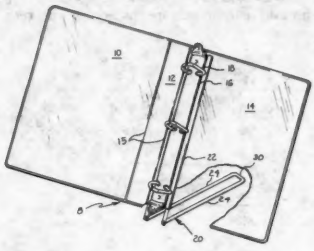
Vytautas K. Beleckis, East Longmeadow, Mass., assignor to Dennison National Company, Holyoke, Mass.

Filed Aug. 15, 1985, Ser. No. 765,846

Int. Cl.[4] B42F *13/00;* A47B *23/00*

U.S. Cl. 402—73 6 Claims

1. Easel type ring binder which has front and back covers, a ring mechanism affixed within said binder and a binder support comprising a generally U-shaped member having a cross-bar portion at its outer end and two parallel, laterally spaced leg portions, each of said leg portions include a hinge at corresponding locations along the length thereof whereby an outer end portion of the support is pivotable relative to the inner portion thereof, at least one of said hinges including stop means for limiting the pivotable movement of the outer end portion of the support to a predetermined acute angle relative to the inner portion, said binder including means for telescopically receiving therein substantially the full length of the leg portions of said support member.



4,576,498

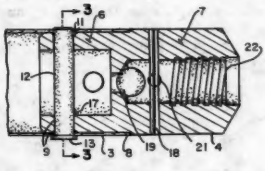
ASSEMBLY STRUCTURE FOR A SOIL SAMPLER

Charles L. Rassieur, St. Louis County, Mo., assignor to Central Mine Equipment, St. Louis, Mo.

Filed Feb. 14, 1985, Ser. No. 701,731

Int. Cl.[4] F16B *19/00*

U.S. Cl. 403—24 8 Claims



1. An improved assembly structure for a soil sampler comprising: a soil sampling tube and a head support therefor, said head support having an apertured tubular wall lower section and said sampling tube having an apertured tubular wall upper section, said sections of said tubular walls being sized to nest in male-female relation with the apertures thereof in alignment said apertures providing a passage extending substantially diametrically and completely through said head support and sample tube, and pin means removably extending completely through said passage to engage said sample tube wall apertures on substantially diametric sides of said head support, said means including a stop member and a movably mounted detent axially spaced therefrom a sufficient distance to position nesting walls of the head support and sample tube therebetween to maintain said pin means in position.

4,576,499

BALL AND SOCKET JOINTS WITH WEAR INDICATOR

Joseph E. Smith, Birmingham, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

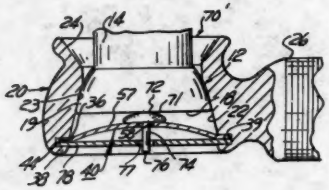
Continuation-in-part of Ser. No. 251,253, Apr. 6, 1981, Pat. No. 4,419,027, and a continuation-in-part of Ser. No. 251,254, Apr. 6, 1981, Pat. No. 4,415,291, and a continuation-in-part of Ser. No. 263,778, May 14, 1980, Pat. No. 4,431,328, and a continuation-in-part of Ser. No. 292,634, Aug. 13, 1981, Pat. No. 4,466,755. This application Sep. 30, 1982, Ser. No. 431,635

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—27 16 Claims

1. A knuckle joint comprising a socket member, a bore in said socket member, a spherical surface in said bore, a ball and stud integral assembly disposed through said bore with said stud projecting through one end of said bore, a spherical surface on said ball in swivelling bearing engagement with said

spherical surface in said bore, a flat surface in said ball opposite to said stud, a cup-shaped retainer cap having an end closed by an end wall and another end open, a partially spherical surface on said end wall of said retainer cap in engagement with said flat surface on said ball, biasing means urging said retainer cap



in a direction urging all said spherical surfaces in mutual engagement and an elongate member attached at said end wall and projecting from said retainer cap through the open end thereof a finite distance when said joint is new and of a lesser finite distance when said joint needs replacement due to wear of said bearing spherical surfaces.

4,576,500

SCAFFOLDING SYSTEM

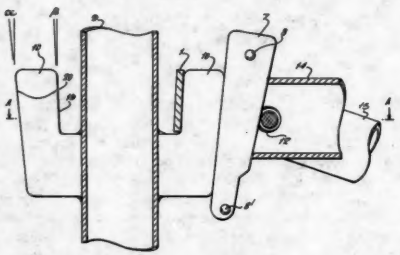
Wah Wong, 6 Sing Woo Road, 5/F, Happy Valley, Hong Kong

Filed Dec. 21, 1983, Ser. No. 564,433

Claims priority, application United Kingdom, Dec. 24, 1982, 8236848

Int. Cl.⁴ E04G 7/00; F16B 7/00

U.S. Cl. 403—49 **22 Claims**



1. A scaffolding system comprising:

a tubular ledger member having an end plate at at least one end and being provided with a pair of aligned slots, a first slot of said pair extending from said end plate parallel with an axis of said tubular ledge member and a second slot of said pair also extending from said end plate parallel with the axis of said tubular ledger member and located opposite said first slot, said second slot having an enlarged inner end;

a wedge for each pair of slots, said wedge being arranged to pass through said first and second slots and having a relatively wider end and a relatively narrower end and first and second retaining means located adjacent the ends of said wedge, said first and second retaining means being adapted to prevent said wedge from being removed from said first slot, said enlarged inner end of said second slot having a sufficient width to permit said narrower end of said wedge with said second retaining means to pass freely therethrough;

and a standard having at least one L-shaped hook attached to and protruding generally radially from said standard, the hook having a shorter arm attached to said standard and a longer arm arranged to receive said tubular ledger member and extend through the pair of slots thereof, said longer arm having an inner edge and an outer edge, the inner and outer edges being angularly inclined with respect to each other so that said longer arm is relatively wider at its free end than at the end attached to the shorter arm;

the wedge being tapered so that its edges simultaneously engage the inner ends of the slots and at least a substantial portion of the entire length of the outer edge of the long arm when the wedge and the long arm are disposed in the pair of slots and their relatively wider ends are proximate each other;

whereby said tubular ledger member can be secured to said hook member by extending the longer arm through said first and second slots and tapping the wedge into place between said longer arm and the inner ends of said first and second slots.

4,576,501

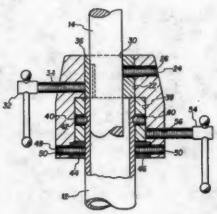
TELESCOPING ROD CLAMP

Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401

Filed Sep. 21, 1984, Ser. No. 652,667

Int. Cl.⁴ F16B 7/10

U.S. Cl. 403—59 **9 Claims**



1. Clamping apparatus for use with a tubular member having an extension member telescopically extendable therefrom, said apparatus for retaining said extension member in a fixed position relative to said tubular member, said apparatus comprising:

a main body member having

a first bore for receiving therein an end of said tubular member; and

a second bore concentric with said first bore, the diameter of said second bore being less than the diameter of said first bore, said second bore for receiving telescopically therein said extension member;

first means for attaching said body member to said tubular member in a manner to permit rotation of said body member relative to said tubular member, yet prevent removal of said body member from said tubular member;

second means for preventing rotation of said extension member relative to said body member, yet permit telescopic extension of said extension member relative to said body member;

third means for selectively preventing rotation of said body member relative to said tubular member, independent of axial movement of said extension member relative to said body member; and

fourth means for selectively preventing axial movement of said extension member relative to said body member, independent of rotational movement of said body member relative to said tubular member.

4,576,502

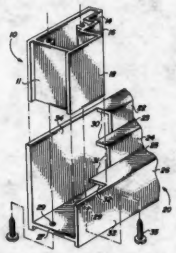
EXTRUDED METAL CORNER CONSTRUCTION

Joseph C. Bancroft, 102 Sweetwater Club Blvd., Longwood, Fla. 32750

Continuation-in-part of Ser. No. 237,394, Feb. 23, 1984. This application Jan. 16, 1984, Ser. No. 570,941

Int. Cl.[4] E04C *2/38*

U.S. Cl. 403—231 7 Claims



1. A structural corner comprising:

(a) a first hollow elongate longitudinal tubing member having:

(i) a first pair of spaced apart parellel planar walls, each wall having a narrow dimension lateral to the longitudinal direction of said first tubing member, in which said narrow dimension of a first one of said pair is less than said narrow dimension of the second one of said first pair;

(ii) a planar first web integrally and orthogonally connected to and extending between said first paid of walls;

(iii) a second web spaced apart from said first web, said second web forming a first plurality of steps extending laterally away from said first web in a staggered, non-overlapping relationship with each other and integrally connected to and extending between said first pair of walls;

(b) a second hollow elongate longitudinal tubing member having:

(i) a second pair of spaced apart parallel planar walls, each wall having a narrow dimension lateral to the longitudinal direction of said second tube member, and having the same difference therebetween in said narrow dimensions as said first pair, said second pair of walls spaced apart to receive said first pair of planar walls slidably therebetween;

(ii) a planar third web integrally and orthogonally connected to and extending between said second pair of walls;

(iii) a fourth web spaced apart from said second web, said fourth web forming a second plurality of steps extending laterally away from said third web in a staggered, non-overlapping relationship with each other and integrally connected to and extending between said second pair of walls, said fourth web cut away at its terminal end in a third plurality of cut-away steps complimentary to said first plurality of steps of said second web wherein a first one of said cut-away steps is equal in height to said first one of said first pair of walls and a last one of said cut-away steps is equal in height to said second one of said first pair of walls; (iv) said first member disposed between said second pair of walls of said second member with a terminal end thereof in abutting relation with said planar third web and with said first plurality of steps of said second web disposed in abutting orthogonal relation with said third plurality of cut-away steps of said fourth web, and such that said second walls of both of said first and second wall pairs of said first and second members are in abutting relationship; and

(c) securing means for maintaining said first member in said abutting relation with said second member.

4,576,503

TORQUE TRANSMISSION ASSEMBLY

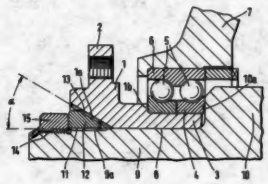
Michel A. Orain, Conflans-Sainte-Honorine, France, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,205

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246233

Int. Cl.[4] F16D *1/06;* F16C *19/08*

U.S. Cl. 403—259 4 Claims



1. In a device for transferring torque from a driving part to a driven part, especially from a rotary constant velocity joint of a driven motor vehicle wheel onto a wheel hub provided for the purpose of fixing said wheel, said two parts defining an axis of rotation and being at least partially coaxial relative to each other with one of said parts being provided with circumferentially spaced teeth extending parallel to said axis of the two parts and with the other of said parts being provided with a widening area in the shape of a truncated cone shell equipped with teeth arranged on said shell surface which extend at an angle relative to said axis of the two parts whose imagined extensions intersect the axis at a point, said device further including a ring having an approximately triangular cross-sectional configuration being provided between said two sets of teeth, said ring having a bore arranged coaxially with said axis and an outer surface forming a triangular area which has been provided with teeth which correspond to the teeth of the other two parts and tightening screw means threadedly engaged so as to be pressed against said ring, the improvement comprising:

that said outer surface of said ring is equipped with outer teeth which engage with said teeth on said shell surface of said truncated cone shell;

that said bore of said ring is provided with inner teeth which engage with said teeth extending parallel to said axis;

that said outer surface of said ring encloses with respect to said bore an acute angle of approximately 30°;

that between said teeth extending parallel to said axis and said inner teeth in said bore of said ring engaging therewith there is provided a radial clearance of between 0.05 and 0.2 mm when said tightening screw means is not tightened so as to be pressed against said ring; and

said ring is elastically and plastically deformed when said tightening screw means is in the tightened state.

4,576,504

ELASTICALLY CONFORMABLE TAPERED PIN-KEY

Thomas A. Hartman, 700 Capac, St. Louis, Mo. 63125

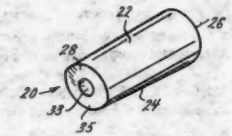
Continuation-in-part of Ser. No. 496,003, May 19, 1983. This application Apr. 29, 1985, Ser. No. 728,265

Int. Cl.[4] F16D *1/06*

U.S. Cl. 403—318 19 Claims

1. An elastically conformable tangential tapered pin-key for securing a part to a shaft extending through a bore in the part, the pin-key adapted to fit into a cylindrical keyway tangentially intersecting the bore and to engage a tangential cylindri-

cal groove in the shaft shallower than the intersection of the keyway and the bore, the pin-key comprising a first cylindrical face and a second cylindrical face that converge toward the bottom of the pin-key, and a longitudinally extending cavity



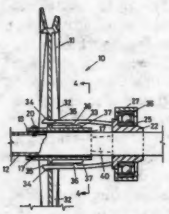
defining sidewalls sufficiently thin to allow the faces to elastically deform, the first face conforming to and engaging the surface of the keyway and the second face conforming to and engaging the surface of the groove in the shaft.

4,576,505

PULLEY MOUNTING MEANS

Robert W. Wrightson, and Anthony D. Colliver, both of St. Marys, Australia, assignors to Coolair Corporation Pte. Ltd., Singapore, Malaysia

Filed Dec. 16, 1983, Ser. No. 562,380
Claims priority, application Australia, Dec. 23, 1982, PF7388
Int. Cl.[4] F16D *1/06*; F16B *7/10*
U.S. Cl. 403—362 6 Claims



1. Pulley mounting means for the mounting of a pulley moulding of polymeric material on a shaft with flat surfaces defining a square cross-sectional shape, wherein said pulley comprises a boss,

said boss having surfaces defining an aperture also of square cross-sectional shape complementary to the shape of the shaft, said surfaces comprising radially inwardly directed interference lobes which extend in an axial direction and which, upon assembly, bear centrally against respective said flat surfaces of said shaft and cause consequential deformation of the boss,

said moulding means further comprising an axially extending moulding, means joining the moulding to the boss, the moulding having tongues separated by slits, the inner surfaces of the tongues defining an aperture of said square cross-sectional shape, the outer surfaces of the tongues defining a cylindrical shape,

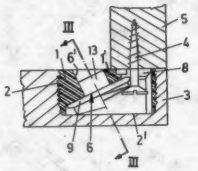
and a bearing having an inner bearing member carried by said tongue outer surfaces.

4,576,506

JOINING DEVICE

Erich Röck, Höchst, and Helmut Hollenstein, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Continuation of Ser. No. 499,430, May 31, 1983. This application Jun. 7, 1985, Ser. No. 742,129
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—407.1 3 Claims



1. A joining device for joining at right angles two furniture parts, said joining device comprising:

a plastic cylindrical dowel casing adapted to be inserted into a bore in one furniture part;

said dowel casing having an open first end to be directed into the bore and a second end closed by an integral transverse portion;

an aperture extending eccentrically through said transverse portion for receipt therethrough of a head of a connecting pin to be fastened to the other furniture part;

a holding member rotatably mounted in said transverse portion of said dowel casing, said holding member including a base accessible from said second end of said dowel casing and engageable by a tool for rotation of said holding member about said base;

said holding member having a cam surface portion facing said open first end and adapted to press on the head of the connecting pin upon rotation of said holding member;

said holding member having an annular rim extending outwardly beyond said cam surface portion and abutting on said transverse portion of said dowel casing;

said dowel casing comprising an integral one-piece member of rigid construction throughout;

said dowel casing including at least one integral projection fitting over said annular rim of said holding member; and

a portion of the plastic material of said transverse portion being deformed over said annular rim, thereby retaining said holding member in said dowel casing to prevent relative axial movement therebetween.

4,576,507

TERRORIST VEHICLE BARRIER

Charles J. Terio, 3171 S. Stafford St., Arlington, Va. 22206

Filed Nov. 28, 1984, Ser. No. 675,556
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 11 Claims

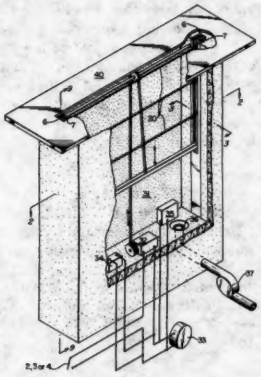
1. A vehicle barrier comprising:

a pair of spaced upright supports positionable in the path of a vehicle,

at least one pair of opposed shock absorbers having telescoping inner and outer portions, one of said pair attached to one of said supports, the other of said pair attached to the other said support, each said shock absorber mounted in a first aperture in one of said supports, one said portion fixed to said support, the other said portion free to reciprocate in said one portion, and

cable means connecting said at least one pair of shock absorbers, said cable means passing through a second aperture in said support adjacent said shock absorber, attaching to said reciprocating portion of said shock absorber,

and passing through a third aperture in said support adjacent said shock absorber and opposite said second aperture to join itself to provide a loop around said shock absorber and around a portion of said support.

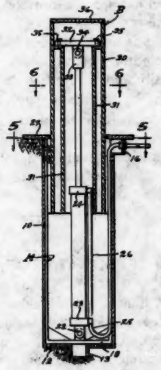


4,576,508

BOLLARD TRAFFICWAY BARRIER AND VEHICLE ARREST SYSTEM

Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91302

Filed Dec. 6, 1984, Ser. No. 679,079
Int. Cl.[4] E01F *13/00, 15/00*
U.S. Cl. 404—6 **30 Claims**



1. A vertically extensible and retractile bollard type trafficway barrier for arresting vehicles, and including;

a below grade level foundation of substantial depth and having an open upper end at grade level and having a vertically disposed guide means extending between said open upper end and a bottom thereof,

a mounting frame removeably inserted into the foundation through and suspended from the open upper end of the foundation and having a support over the bottom of the foundation, the support having a centered attachment carrying a power operable lift means disposed on a vertical operational axis,

a bollard of tube form centered over the power operable lift means and within the foundation and slideably engageable with said guide means for vertical disposition, the upper end of the bollard being accesible and coupled to a reciprocating rod of the power operable lift means to extend the top of the bollard from a retracted position flush with the grade level,

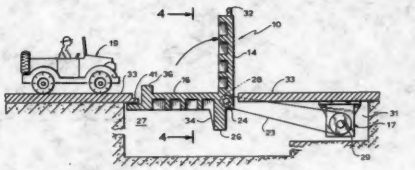
and controlled power means to actuate the power operable lift means for reciprocation of the rod and bollard between extended and retracted positions.

4,576,509

SECURITY GATE

John E. Beaty, Sr., 107 Miami Gardens Rd., Hollywood, Fla. 33023

Filed Sep. 17, 1984, Ser. No. 651,328
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **8 Claims**



1. A security gate for a vehicular driveway consisting of two sections of pavement spaced apart by an opening, the security gate comprising:

a substantially planar barrier having a straight horizontal pivot axis disposed substantially at a right angle to the direction of the driveway and at a level no higher than the surface of the pavement, the barrier pivotably supported at said pivot axis between an upper vertical postion with a side facing and for stopping approaching traffic and a lower position in which it fills the opening for providing a driving surface flush with the pavement;

a substantially planar surface element disposed perpendicularly to said barrier and rigidly attached thereto along said pivot axis, the surface element substantially congruent with said opening and operating to fill the opening when said barrier is in its upper position;

said barrier and said surface element providing an L-shaped structure having an open side above said surface element and in front of said barrier, so that a vehicle crashing into said barrier rests on said surface element and the weight of the vehicle counteracts the force of the vehicle crashing into the barrier;

a pit below the opening for receiving the surface element when the barrier is in its lower position;

means for rotating said barrier with the surface element between its upper vertical and its lower horizontal position;

means for pivotably supporting the barrier with the surface element along said pivot axis.

4,576,510

TECHNIQUE FOR THE LOCATION OF EXPANSION JOINTS WHEN CASTING A CONCRETE BED

Stig-ake Ljungkvist, Bäckvägen 26, S-541 35 Skövde, and Lennart Johansson, Snuggeliisgatan 3, S-542 00 Mariestad, both of Sweden

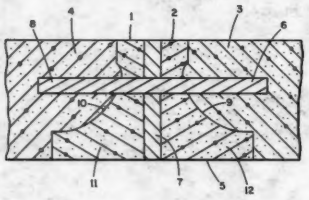
PCT No. PCT/SE83/00162, § 371 Date Dec. 28, 1983, § 102(e) Date Dec. 28, 1983, PCT Pub. No. WO83/03862, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 25, 1983, Ser. No. 568,182
Claims priority, application Sweden, May 3, 1982, 8202755
Int. Cl.[4] E01C *10/04*
U.S. Cl. 404—49 **7 Claims**

1. A method of forming an expansion joint when casting a concrete floor on a surface to be concreted, the method comprising:

precasting a pair of elongated concrete rails, each concrete rail having a smooth top surface, a first vertical surface being planar, and an opposite second vertical surface with an upper tongue, a lower tongue, and an intermediate groove;

locating the pair of elongated concrete rails with the first vertical surfaces of the rails facing each other and defining a space therebetween, the rails being separated by the space;

filling the space between the first vertical surfaces of the rails with filler material;



permanently positioning and levelling the pair of rails and filler material on the surface to be concreted where an expansion joint is desired, with the top surfaces of the rails at the height of the desired concrete floor surface;

pouring cement adjacent the pair of rails;

levelling the cement adjacent the pair of rails utilizing the top surfaces of the rails as a levelling guide; and

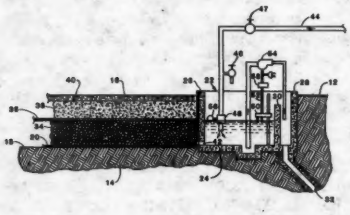
hardening the cement adjacent the pair of rails to form the concrete floor adjacent the pair of rails, with the pair of rails remaining in place as positioned and levelled, such that the pair of rails become a permanent, integral part of the concrete floor and form an expansion joint in the concrete floor.

4,576,511

APPARATUS AND METHOD OF CREATING AND CONTROLLING AN ARTIFICIAL WATER TABLE

Stephen P. Vidal, Jr., 30020 Santa Cecilia, Temecula, Calif. 93430

Filed Jul. 25, 1983, Ser. No. 517,012
Int. Cl.[4] A01G *25/00*
U.S. Cl. 405—37 **9 Claims**



1. A structure for creating and controlling an artificial water table, comprising in combination:

a substantially watertight basin having a floor;

a ballast layer covering the floor of said substantially watertight basin to a substantially uniform thickness and including interstices through which water can flow in any direction;

a fine layer composed predominatly of fine particulate matter through which water is dispersed by capillary action;

permeable means through which water can pass readily but through which the fine particulate matter of said fine layer cannot pass, disposed on top of said ballast layer, and on which said fine layer is overlaid, whereby said permeable means prevent the fine particulate matter of said fine layer from settling into said ballast layer and clogging the inerstices of said ballast layer thereby choking off the flow of water through said ballast layer; and,

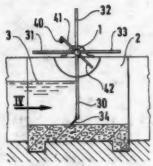
control means for maintaining in said ballast layer a present water level that is lower than said permeable means, and for raising the water level at least as high as said permeable means when subsurface irrigation is to be applied, whereby water that contacts said permeable means is drawn upward through said fine layer by capillary action.

4,576,512

ROTARY SLUICE GATE

Gilles Combes, Grenoble, and Germain Delage, Montbonnot, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Jun. 28, 1984, Ser. No. 625,477
Claims priority, application France, Jul. 4, 1983, 83 11086
Int. Cl.[4] E02B *7/40*
U.S. Cl. 405—100 **9 Claims**



1. A rotary sluice gate for controlling the flow through a canal sluice wherein it is installed, said gate consisting of a vane wheel, said wheel including a horizontal shaft mounted transversely across the top of the sluice for rotation about its axis, said wheel having at least three radial vanes fixed about said shaft at circumferential positions, said vanes being of a length so as to be partially and sequentially immersible for operating the gate using the hydraulic energy of the canal for rotating said wheel and means for establishing within the sluice different closing surface areas, and said sluice gate including gate locking means for successively maintaining said wheel at positions where at least two of said vanes are fixedly immersed in the canal sluice.

4,576,513

PROCESS FOR TERMINAL STORAGE OF PUMPABLE WASTES

Walter Lindörfer, Kassel, and Wilhelm Jahn-Held, Staufenberg, both of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,899
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141884
Int. Cl.[4] B65G *5/00*; B09B *1/00*; C02F *7/00*; G21F *9/24*
U.S. Cl. 405—128 **15 Claims**

1. A process for terminal storage of a water-containing pumpable waste containing a liquid phase comprising the steps of pumping said waste into a salt cavern and increasing the specific gravity of said liquid phase with a material selected from the group consisting of soluble salts which crystallize at cavern temperature with incorporation of water of crystallization from the liquid phase and are selected from the group consisting of $MgCl_2$, $MgSO_4$ and mixtures thereof in an amount sufficient to form, in the NaCl—$MgSO_4$—H_2O system, a solid salt selected from the group consisting of (3156 g Na_2SO_4+3124 g Mg_2SO_4+1000H_2O) and (1972 g Na_2SO_4+1673 g $MgSO_4$+1000H_2O) and in the NaCl—$MgCl_2$—H_2O system, the solid salt (1880 g $MgCl_2$+1000H_2O); solutions of said salts; organic materials which solidify at cavern temperature in the

liquid phase of the pumpable waste or increase the specific gravity thereof; and adsorbents, in order to minimize convergence of the salt cavern by narrowing the difference between the specific gravity of the salt cavern walls and the specific gravity of the liquid phase of the pumpable waste by converting the liquid phase to a paste-like or solid consistency.

4,576,514

DEVICE FOR LAYING OUT A PIPELINE

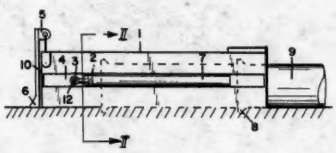
Karl I. Nielsen, Hundstrupvej 42, 5750 Ringe, Denmark

PCT No. PCT/DK82/00044, § 371 Date Dec. 30, 1982, § 102(e) Date Dec. 30, 1982, PCT Pub. No. WO82/04110, PCT Pub. Date Nov. 25, 1982

PCT Filed May 19, 1982, Ser. No. 459,694

Int. Cl.⁴ F16L *1/02*

U.S. Cl. 405—154 **3 Claims**



1. A device for laying down a pipeline on land consisting of pipe sections which are pushed together, the device comprising:

a frame of sufficient cross-section to encompass the diameter of a pipe section,

a cutter mounted on the front of the frame and engageable with the earth below the frame to create a smooth bed for the pipe,

a pair of engines having two parts movable relative to each other with one part connected to said frame,

a cross member connected at each end to said other part of said engines and extending therebetween and located to engage an end of a pipe section when said engines are activated forcing the frame forward, so that said frame will be moved away from said pipe section in a longitudinal direction, thereby preparing the underlying bearing surface for said pipe section.

4,576,515

PIPE LAYING APPARATUS

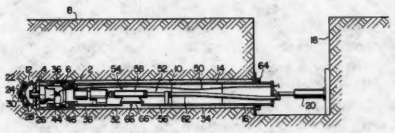
Keiji Morimoto, Yokohama; Shuichi Satoh, Ibaraki; Yoshiyuki Iwai, Ibaraki; Osamu Ae, Ibaraki; Masao Suda, Tsuchira; Kiyoshi Tsuchiya, Ibaraki; Kojiro Ogata, Ishioka, and Naoki Miyanagi, Ibaraki, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Hitachi Construction Machinery Co., Ltd., both of Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,744

Claims priority, application Japan, Sep. 20, 1982, 57-162130; Sep. 20, 1982, 57-162131

Int. Cl.⁴ F16L *1/02*

U.S. Cl. 405—184 **12 Claims**



1. A pipe laying apparatus comprising: excavator means for forming a substantially horizontally extending hole in the earth, said excavator means having connected to a trailing end thereof a leading end of at least one underground pipe at least partially located in said horizontally extending hole; injector means for injecting a viscosity imparting liquid into the earth in which evacuation is being performed by the evacuator means to produce viscosity imparting liquid containing soil particles, propulsion means positioned against a trailing end of the pipe and located in a starting pit whereby, said viscosity imparting liquid containing soil particles produced by said evacuator means are conveyed rearwardly of the excavator means past an outer periphery thereof and filled in an annular gap defined between the horizontally extending hole and the pipe while said excavator means and pipe are advanced by said propulsion means; soil particle discharging means located between the trailing edge of said excavator means and the leading end of said pipe and within said pipe for introducing into said pipe the viscosity imparting liquid containing soil particles conveyed rearwardly of the excavator means past the outer periphery thereof and discharging the soil particles into the starting pit through said pipe; said excavator means including an excavator main body and rotary excavating tool means rotatably mounted at a forward end of said excavator main body, said excavator main body having drive means mounted therein for rotatably driving said tool means, said drive means including a hollow rotary drive shaft connected to said rotary excavating tool means for driving thereof; and conduit means for supplying said viscosity imparting liquid to said injector means, said conduit means including said hollow rotary drive shaft opening at one end outside said excavator main body so as to communicate with the injector means whereby the hollow rotary drive shaft is commonly used for forming a portion of the conduit means.

4,576,516

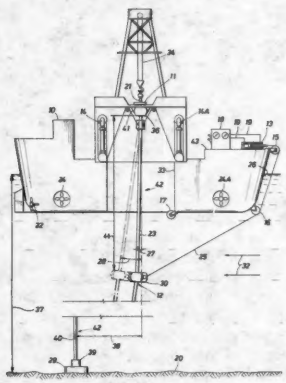
RISER ANGLE CONTROL APPARATUS AND METHOD

Early B. Denison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 28, 1984, Ser. No. 675,668

Int. Cl.⁴ E21B *7/12*

U.S. Cl. 405—195 **8 Claims**



1. For use with a floating vessel having well drilling equipment, including an elongated riser having upper elements connected to said floating vessel by vessel connection means, and first flexible coupling means located adjacent said vessel connection means, said riser extending down from said vessel connection means to a point adjacent the ocean floor, the improvement comprising riser angle control apparatus comprising:

second flexible coupling means operatively engaged with a portion of said upper elements of said riser below said first flexible coupling means,

flexible element prime mover means carried by said vessel, and

at least one flexible element means having a first end and a second end, said first end operatively engaged with said second flexible coupling means, said second end operatively engaged with said flexible element prime mover means.

4,576,517

MARINE HEAVE COMPENSATING DEVICE

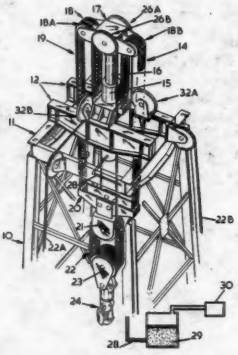
James McCann, West Lothian; James Langley, Midlothian; Ian Hopper; Steven Durham, both of Edinburgh; Thomas Scott, E. Lothian, and Eric R. McOmish, Edinburgh, all of Scotland, assignors to 501 Vickers PLC, London, England

Filed Oct. 19, 1984, Ser. No. 663,055

Claims priority, application United Kingdom, Oct. 21, 1983, 8328147

Int. Cl.[4] B63B *35/44*

U.S. Cl. 405—195 4 Claims



1. A marine heave compensating device comprising

a support structure,

a hydraulic piston and cylinder unit of which the cylinder is fixedly mounted on the support structure, the piston being connected to a piston rod carrying a cross-head, first pulley means rotatably mounted on the cross-head, a yoke suspended by one or more substantially inextensible flexible members secured at one end to the yoke and passing around said first pulley means, the other end or ends of said flexible members being secured to said support structure,

and a suspension system comprising a crown block mounted on the yoke, a cable reeved around the crown block and around a travelling block on which is mounted a tool carrier, the two ends of said cable being respectively reeved around two second pulley means rotatably mounted on said cross-head, one end of the cable thereafter being connected to a draw-works and the other end of the cable thereafter being connected to a tie-down on said support structure, the number of pulley wheels in said first pulley means being the same as the number of pulley wheels in said second pulley means.

4,576,518

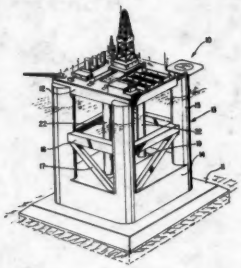
FIXED/MOVABLE MARINE STRUCTURE SYSTEM

William J. Cooke, Kelowna; James N. Dancey, Calgary; George B. DeBoon, Calgary; Norman W. Miller, Calgary, and Glen R. Yungblut, Ottawa, all of Canada, assignors to EPI Resources Ltd., Calgary, Canada

Filed Feb. 22, 1984, Ser. No. 582,257

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—205 28 Claims



1. A platform for use in combination with a foundation affixable to a sea bed to provide a marine structure system for use at selected offshore locations, said platform being capable of alternately existing in a fixed mode in which the platform is releasably coupled to the foundation, and in a floating mode in which the platform is uncoupled from the foundation, said platform comprising:

at least one working deck; and

a supporting structure for supporting the deck above the water when the platform is in floating mode or in fixed mode;

said supporting structure including:

buoyancy adjustment means capable of adjusting the buoyancy of the platform from a first pre-selected buoyancy value correlatable with a first draught value suitable for floating mode operation to a second pre-selected lower buoyancy value correlatable with a second greater draught value, so that the base of the platform may be positioned sufficiently close to the foundation to permit conversion to fixed mode operation, and subsequently, while the platform remains coupled to the foundation, to a third pre-selected buoyancy value greater than the second buoyancy value, correlatable with an equivalent draught value less than the second draught value; and

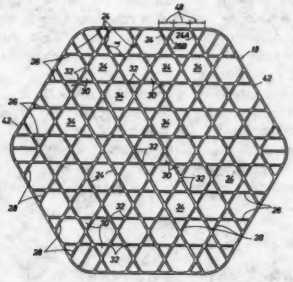
securing means for releasably engaging the foundation so as to convert the platform from floating mode to fixed mode and vice-versa, by controllably releasably rigidly coupling the platform to the foundation to substantially eliminate heave, pitch and roll of the platform due to sea and wind forces, and by controllably uncoupling the platform from connection with the foundation;

wherein the securing means is capable of keeping the platform coupled to the foundation when the buoyancy value of the platform is equal to said third pre-selected buoyancy value.

4,576,519
OFFSHORE PLATFORM BASE

Robert F. Mast, Auburn; William J. Cichanski, Tacoma; Francis R. Walker, Federal Way, all of Wash., and Donald D. Magura, Vancouver, Canada, assignors to Exxon Production Research Co., Houston, Tex.

Filed May 23, 1983, Ser. No. 497,389
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—207 3 Claims



1. An improved base for an offshore platform, said base comprising:

a bottom plate contacting the ocean floor;

three sets of continuous, substantially parallel bulkheads, each said bulkhead having a top, bottom and outer edges, said bulkheads being attached along said bottom edge to said bottom plate, the bulkheads of each set intersecting at least a portion of the bulkheads of the other two sets at an angle of about 120° to form a substantially repeatable grid pattern of contiguous triangular and hexagonal-shaped chambers;

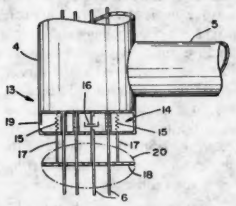
top plate means contacting the top edge of said bulkheads; and

perimeter wall means attached to said bottom plate and cotacting said top plate means and circumscribing and attached to the outer edges of said three sets of bulkheads so that the outer edges of said bulkheads attach to said perimeter wall means at substantially equally spaced intervals along the length of said wall means.

4,576,520
MOTION DAMPING APPARATUS

Sung L. Suh, Orinda; Gerald E. Burns, Walnut Creek, and William H. Silcox, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 464,247, Feb. 7, 1983, abandoned. This application Oct. 11, 1984, Ser. No. 659,601
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 27 Claims



1. A motion damping apparatus for substantially dampening structural motion in an offshore structure due to secondary wave excitation, comprising:

an offshore structure; and

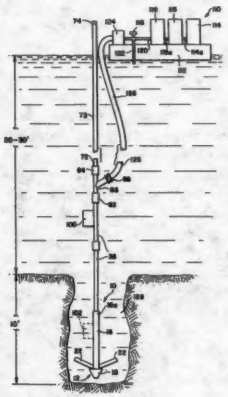
means for damping motion due to secondary wave excitation, comprising a mechanical energy absorbing means fixedly connected to said offshore structure and a suspended submerged mass fixedly connected to said mechanical energy absorbing means;

said submerged mass and said mechanical energy absorbing means being selected to substantially dampen the structural motion of said structure due to secondary wave excitation.

4,576,521
PERMANENT MOORING METHOD AND ARRANGEMENT

Joseph Conrad, 2929 Campbell St., Kansas City, Mo. 64109

Filed Dec. 30, 1983, Ser. No. 567,068
Int. Cl.[4] B63B *21/26;* E02D *5/54*
U.S. Cl. 405—225 29 Claims



1. A permanent mooring method for embedding a permanent mooring device in a sea bottom, comprising the steps of:

(a) providing the permanent mooring device with a hollow tubular body having a bottom end including a nozzle;

(b) lowering the permanent mooring device into the sea until the bottom end contacts the sea bottom;

(c) transmitting fluid under high pressure, via said hollow tubular body, to said nozzle during a first time interval so as to create a fluidized area in the sea bottom around the permanent mooring device and to wash said permanent mooring device into the sea bottom;

(d) transmitting a cementitious substance, via said hollow tubular body, to said nozzle during a second time interval so as to fill the fluidized area in the sea bottom with said cementitious substance; and

(e) halting the transmission of the cementitious substance at the end of said second time interval so as to allow said cementitious substance to consolidate around the permanent mooring device, whereby to form said permanent mooring;

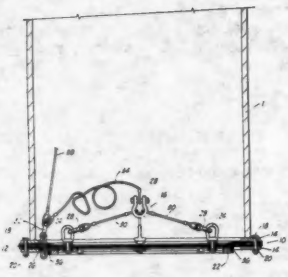
wherein, during at least one of said steps (d) and (e), the permanent mooring device is vibrated to assist in homogenizing the cementitious substance during transmission thereof to said nozzle during the second time interval in the case of vibration during step (d), and to assist in settling of the cementitious substance as it consolidates around the permanent mooring device in the case of vibration during step (e).

4,576,522

RUPTURABLE CLOSURE

Tommie A. Freeman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 21, 1984, Ser. No. 653,803
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—225 18 Claims



1. A diaphragm assembly for use on annular members of marine structures, said diaphragm assembly comprising:

a diaphragm;

a pair of flat annular plates retaining the diaphragm therebetween, one of the flat annular plates being secured to said annular member; and

a diaphragm rip-out assembly for removing a portion of the diaphragm from between the pair of flat annular plates, the rip-out assembly comprises:

a rip-out shim;

a rip-out eyebolt; and

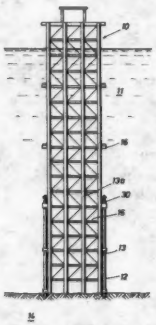
a rip-out cable having one end thereof secured to the rip-out eyebolt and the other end thereof secured to the rip-out shim.

4,576,523

PILE RELEASE MECHANISM

Edward C. Smetak, Harvey, La., assignor to Exxon Production Research Co., Houston, Tex.

Filed Nov. 25, 1983, Ser. No. 555,228
Int. Cl.[4] E02B *17/02*; E02D *5/00*
U.S. Cl. 405—227 12 Claims



1. Apparatus , capable of releasing under load, for releasably connecting a pre-installed pile to a pile guide connected to an offshore platform and surrounding the upper end of said pile, said pile having an opening adjacent the upper end of said pile guide comprising:

a pile releasable latch mechanism supported in said pile including:

latch support means mounted in said pile;

latch support pins arranged on said latch support means;

a pair of latches rotatable on said latch support pins from a latch position in which one end of each of said latches extends through said opening in said pile to latch onto the upper end of said pile guide to an unlatched position in which said latches are retracted to positions within said pile;

a pile latch assembly connected to each of the other ends of said latches and supported on said latch support means capable of collapsing to move said latches from their extended latch positions to their retracted unlatched positions;

a slide plate capable of moving downwardly from a first to a second position releasably retainable on said latch support means in said first position; and

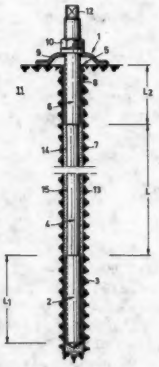
means on said slide plate capable of engaging said pile latch assembly cause said linkage means to collapse when said slide plate moves from its first to its second position.

4,576,524

ROCK ANCHOR ARRANGEMENT

Peter Heintzmann, Bochum; Manfred Koppers, Duisburg; Karlheinz Bohnes, and Gerhard Hecken, both of Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhuette Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,563
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 8311672[U]
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—260 7 Claims



1. A rock anchor arrangement adapted to be inserted into and held by a body of hardenable adhesive in a bore provided in a rock structure, particularly in a rock formation of a tunnel or a mine construction, comprising an elongated anchoring rod including a leading end elongated portion and a trailing end elongated portion as considered in the direction of insertion of the anchoring rod into the bore, said leading end portion having at least one circumferential projection at its outer circumference; and a supporting plate arranged to contact the rock formation around the bore at an open end thereof, said trailing end portion having an end extended through said supporting plate and being displaceable relative to said plate, said anchoring rod further including an intermediate longitudinal portion extended between said leading end portion and said trailing end portion, said intermediate portion having a smooth outer surface and the length which is substantially greater than the

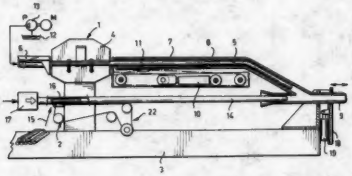
length of said trailing end portion and said leading end portion, respectively, said leading end portion and said trailing end portion being adhesively secured with said bore by said hardenable adhesive, and said intermediate portion having on its surface and over the entire length thereof an adhesive repellent means whereby a relative displacement between said intermediate portion and said hardenable adhesive is possible, said intermediate portion being free of projections on the outer surface thereof and extending between said circumferential projection on said leading end portion and said trailing end portion, said trailing portion including a sleeve extending inwardly of the rock structure towards said leading end portion and partially surrounding said intermediate portion with a play so that said intermediate portion is guided in the sleeve and has a length additionally increased by a value corresponding to the length of said sleeve.

4,576,525

METHOD AND EQUIPMENT FOR PERFORMING ROCK BOLTING

Onni Issakainen, and Pertti Heikkilä, both of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Feb. 23, 1984, Ser. No. 583,023
Claims priority, application Finland, Apr. 26, 1983, 831423
Int. Cl.⁴ E21C *11/00*
U.S. Cl. 405—269 **3 Claims**



1. Equipment for performing cement bolting for reinforcement of rock, which equipment comprises

a feeding pipe (5) for feeding a cementing agent (12) into a drill hole (20), and

means (4 to 10) for shifting the feeding pipe (5) into the drill hole (20), characterized in that the equipment comprises

a guide (14) for shifting a capsule/capsules (16) from a charging station (15) into the drill hole (20),

means (22) for moving the guide axially back and forth,

means (17) for shifting the capsule/capsules (16) along the guide (14), and

a nozzle (9) to be positioned at the mouth of the drill hole (20), through which nozzle both the guide (14) and the feeding pipe can be shifted alternatingly into the drill hole (20).

4,576,526

ARRANGEMENT FOR SUPPLYING POWDERED MATERIAL TO A SPRAYING DEVICE

Niklaus Müller, Rosenau, France, and Daniel Audemars, Echandens, Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland

Continuation of Ser. No. 361,890, Mar. 25, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 693,220
Claims priority, application Switzerland, Apr. 1, 1981, 2216/81
Int. Cl.⁴ B65G *53/40*
U.S. Cl. 406—75 **5 Claims**

1. A powder transport system for supplying powdered material to a flame spray device for thermal spraying which comprises,

at least two powder storage containers,

each having an exit orifice for delivering powder therefrom,

at least two powder feed means each comprising a substantially horizontally disposed elongated enclosed channel member, each having means for supplying inert protective gas therethrough,

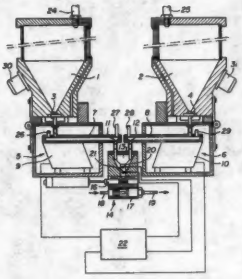
each coupled at one end to the exit orifice of a corresponding storage container for receiving powder therefrom,

each of said enclosed channel members having an exit port at its other end coupled to a single buffer chamber of a substantially frustonconical shape which opens upwardly,

each of said enclosed channel members being adapted to vibrate along its length to effect powder delivery to said buffer chamber,

vibrating means mechanically coupled to each of said enclosed channel members for adjustably controlling the vibration along the length of each of said enclosed channel members,

level-detecting means disposed within said buffer chamber



adapted to provide a level range over which the depth of said powder in said chamber is to be controlled,

an exit orifice at the bottom of said buffer chamber,

a powder-injection device having a transfer duct for receiving said powder coupled to said chamber exit orifice and a selector device cooperating therewith for varying the flow of powder between the buffer chamber and the injection device,

said injection device having an inlet end for receiving carrier gas and an outlet end for delivering powder suspended in said carrier gas to a flame spray device,

and a control device coupled to each of the vibrating means and responsive to the level-detecting device in the buffer chamber for regulating powder feed to said buffer chamber via said vibrating means either together or separately, whereby to maintain the powder level in the buffer chamber at the desired level and thus achieve substantially constant rate of powder flow to said flame spray device.

4,576,527

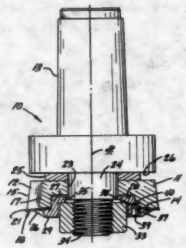
SHAPER CUTTER

Edward W. Haug, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Continuation-in-part of Ser. No. 515,795, Jul. 21, 1983, abandoned. This application May 31, 1984, Ser. No. 615,775
Int. Cl.⁴ B23F *21/28*
U.S. Cl. 407—28 **36 Claims**

1. A tool for cutting metal, said tool comprising, an elongated body having a circular cross section and a forward end, a plurality of outwardly projecting teeth formed on the periphery of said forward end portion of said body and angularly spaced around the latter, the forward end of said body being concave and forming a non-planar surface, a thin sheet metal wafer overlying said forward end surface of said body and having a plurality of cutting teeth formed along the periphery thereof and being equal in number to the teeth on said body, each cutting tooth on said wafer being larger at its ends, sides

and roots than the corresponding tooth on said body whereby the cutting teeth on the wafer extend slightly beyond the ends, sides and roots of the teeth on the body, said wafer being flexible to confrom to the shape of said forward end surface and to lie against the latter, and means adjacent the forward end portion of said body and disposed radially inwardly of the cutting teeth on said wafer for flexing said wafer to cause the



wafer to lie against said concave forward end surface and to clamp the wafer to said body, the cutting teeth on said wafer when the wafer is flexed generally conforming to the teeth on said body whereby the cutting teeth on the wafer are backed by the teeth on the body and are operable to cut a workpiece as the body is advanced longitudinally in such a direction as to maintain said wafer cutting teeth against said body teeth.

4,576,528

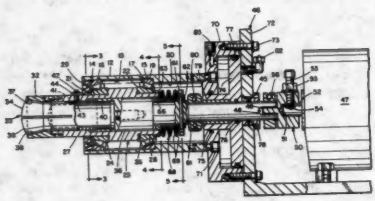
ROTARY TOOL HOLDER

Phillip A. Sollami, 1300 E. Pine, Herrin, Ill. 62948

Filed Mar. 13, 1984, Ser. No. 588,922

Int. Cl.⁴ B24B *19/00*; B23Q *5/22*; B23B *31/24*

U.S. Cl. 408—140 **13 Claims**



1. A rotary tool holder comprising:

a housing;

a substantially cylindrical spindle mounted for rotation within said housing;

a collet within said spindle moveable between an open and a closed position for holding the tool;

a shaft connected to said collet for moving said collet between the open and closed positions and for rotating said collet;

means for rotating said shaft;

means for longitudinally moving said shaft into said open and closed positions; and

means for transferring torque from said rotating shaft to said spindle for rotating said spindle, said means for transferring torque including means for limiting said torque transmitted to a predetermined maximum level providing for protection of the holder from an overload force on said spindle.

4,576,529

MULTIPURPOSE CLAMPING DEVICE FOR WORKPIECES, PARTICULARLY OF WOOD

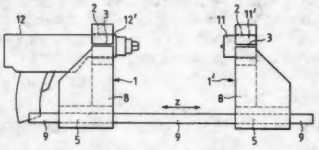
Hans Forrer, Feldweg 854, Oberhelfenschwil, Switzerland

Filed Mar. 9, 1984, Ser. No. 588,042

Claims priority, application Switzerland, Mar. 9, 1983, 1274/83

Int. Cl.⁴ B23P *23/09*

U.S. Cl. 408—240 **7 Claims**



1. A multi-purpose clamping device for a modular tool comprising:

first and second clamping jaw members each having a front face with a modular tool clamping receiving opening which are each aligned with each other, guide means on which said jaw members are movable toward and away from each other without canting, securing means for securing a tool in the respective receiving opening, said first and second clamping jaw members each having a spindle opening therethrough extending parallel to the direction of movement of said jaw members, a spindle with opposite threads in said spindle openings of said jaw members, and a quick-action clamping mechanism in each jaw member engageable with said spindle for movement of a respective jaw member along said spindle with rotation of said spindle.

4,576,530

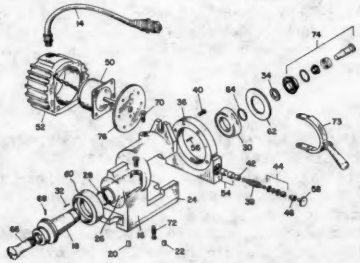
INDEXING DEVICE

Gene F. Haas, 18819 Dylan St., Northridge, Calif. 91324, and Kurt P. Zierhut, 10155 Nevada Ave., Chatsworth, Calif. 91311

Filed Mar. 5, 1984, Ser. No. 586,425

Int. Cl.⁴ B23D *7/08*

U.S. Cl. 409—223 **5 Claims**



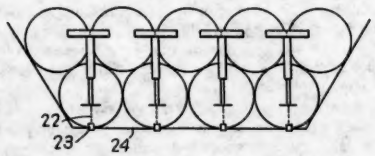
1. An indexing fixture for rotative positioning of a work comprising a casting mounting, a rotating spindle mounted in said mounting, a collet in said spindle, a worm and worm gear adapted to rotate said spindle, a synchronous stepping motor adapted to control the rotation of said worm, the motor and worm connected by a universal joint, wherein the worm and worm gear are contained in a housing, O-rings inside the housing adapted to exert pressure between the worm gear and worm gear housing.

4,576,531

DEVICE FOR STOWING LOADS OF LARGE-SIZED BALES OF FODDER ON A VEHICLE

Pascal Cosnet, "Le Patis", 72550 Coulans sur Gee, France

Filed May 6, 1985, Ser. No. 731,144
Claims priority, application France, May 9, 1984, 84 07147
Int. Cl.[4] B60P 7/08, 1/64; B61D 3/16; A01D 85/00
U.S. Cl. 410—36 10 Claims



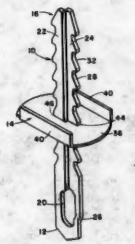
1. Device for stowing loads of large-sized bales of fodder, and in particular round bales, on a vehicle, wherein said device is composed of a T-shaped movable member constituted of at least one horizontally-extending elongated element in the middle part of which is perpendicularly fixed the upper end of a vertical arm, said horizontal element being equipped at each end with at least one needle which is engaged in two juxtaposed bales and said arm being equipped at its lower end with an anchoring member adapted to be engaged in at least one bale situated below two juxtaposed bales receiving the needles of the horizontal element, said device comprising two guiding members for a strap, one member of which is situated in the center of the horizontal element along the vertical axis thereof, the other member being situated at the lower end of the arm on the opposite side of the anchoring member and, said strap being provided with means of stretching it and fastening it to the vehicle chassis.

4,576,532

INSULATION STUD

Michael R. Hanson, Tulsa, and Frank C. Bryant, Sapulpa, both of Okla., assignors to Hanlock, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 529,559, Sep. 6, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 711,187
Int. Cl.[4] E04B 1/62; F16B 21/04
U.S. Cl. 411—352 12 Claims



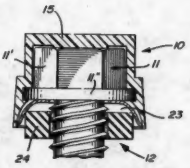
1. A retainer assembly for securing a sheet-like material to a wall comprising an elongated stud having an inner end adapted to be welded to said wall and extending outwardly therefrom so as to be perpendicular to said wall, said stud having a pointed outer end whereby said sheet-like material can be impaled thereon and positioned so as to be adjacent said wall, said stud being provided with a longitudinal slit extending from the outer pointed end to a location adjacent the inner end so as to form a pair of longitudinal fingers, said stud being bent adjacent said location whereby said fingers are laterally offset from each other, said fingers being provided with alternate outwardly extending teeth and recessed notches along the longitudinal sides of the fingers opposite from said slit, and a thin flat plate provided with a central opening therein such that the pointed end of said stud can be inserted through said central opening to permit the plate to be slidably received on said stud, said central opening in said plate being formed by a pair of rectangular openings laterally offset with respect to each other and overlapping, the maximum dimension of the opening across the opposite ends of the rectangular openings being approximately equal to the distance between the notch on one finger and an opposed notch on the other finger, whereby, when said plate is urged in a direction from the pointed end of the stud towards the inner end thereof, said fingers will move in a scissors fashion as the plate passes over the teeth on the fingers, and whereby, when the plate comes to rest in a desired position in a pair of opposed notches on the fingers, the fingers will spring back towards their original disposition to lock the plate in the desired position.

4,576,533

ATTACHMENT CAP FOR FASTENER HEAD

George R. Chartier, Laval, Canada, assignor to O. J. Ouellette Inc., Quebec, Canada

Filed Jun. 25, 1984, Ser. No. 624,364
Int. Cl.[4] F16B 19/00, 33/00
U.S. Cl. 411—373 5 Claims



1. A cap for securement over the head of a fastener, and wherein an annular dome-shaped cover is located under said fastener head to compress a flexible annular washer disposed about a fastener shank, said cap being molded of synthetic resinous material and having a hollow head portion and a cap attachment portion, said head portion having a top wall and an integral annular side wall, said attachment portion being formed integral with said annular side wall and disposed circumferentially below said side wall, said attachment portion having an annular channel in an inner wall thereof for receiving in snap-fit engagement therein a circumferential flange of a fastener head to secure said cap over the fastener head, a circumferential shoulder portion formed below said inner annular channel, and an outwardly flared annular tapering skirt depending from said shoulder portion, said skirt having a concave outwardly tapering inner wall and a straight sloped outer wall whereby said skirt is of decreasing thickness in a direction away from said shoulder portion to define a flexible lip, said skirt being of a length sufficiently long to receive thereunder said dome-shaped cover and flexible annular washer, said skirt being thinner in thickness than said head portion and more resilient for greater flexibility.

4,576,534

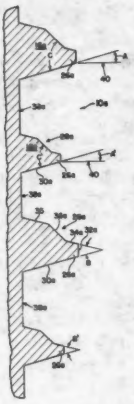
THREAD FORM FOR SOFT MATERIAL

Gerald D. Barth, South Elgin, and David P. Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,108
Int. Cl.[4] F16B 33/02
U.S. Cl. 411—412 13 Claims

1. A threaded fastener comprising a shank having an enlarged head at one end and an entering portion at the other end, at least one thead on said shank, said thread including an upper and a lower flank, said upper flank having a compound surface larger in area than that of said lower flank, said compound surface comprising a plurality of three smooth helical

surfaces, two inner surfaces of said three helical surfaces forming an obtuse included angle and forming a continuous helical protrusion on said thread, an outer end of said three surfaces forming an acute angle with said lower flank, whereby said



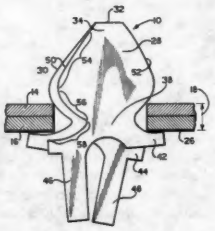
thread has an assymetrical transverse cross-section adapted to increase surface friction between said upper flank and workpiece material which is deformed upon tightening of said fastener after contact between said head and a workpiece.

4,576,535

NONRESILIENTLY DEFORMABLE FASTENER

Robert Howering, Montville, N.J., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 16, 1983, Ser. No. 552,534
Int. Cl.[4] F16B *19/08*
U.S. Cl. 411—503 **4 Claims**



1. A one-piece sheet metal dart type fastener for joining and retaining two or more panels having a combined axial thickness within a given range and aligned apertures of a given diameter, said fastener comprising:

first and second generally flat sidewall portions folded over upon themselves in close side-by-side relation and defining a bight portion therebetween, each of said sidewall portions comprising a nose section adjacent said bight portion, a panel engaging section extending downwardly from the nose section, a base section extending downwardly from the panel engaging section and a tab section extending downwardly from said base section, the two tab sections extending downwardly from opposite transverse ends of the base portions, the sidewalls of said engaging sections each defined by an edge on at least the transverse side thereof opposite the transverse base end from which the tab portion extends comprising a first segment extending transversely outwardly and downwardly from said nose section, a second segment extending transversely inwardly and downwardly from said second segment and a third segment extending transversely outwardly and downwardly from said second segment;

in the initial nondeformed configuration of said fastener, said sidewall portions aligned to define in projection a dart shape wherein the junctions of said first and second edge segments of said first and second sidewall portions are transversely separated by a distance equal to or less than the diameter of said apertures in said panels and at least the lower parts of said third edge segments on said first and second sidewall portions are transversely separated by a distance greater than the diameter of said apertures in said panels;

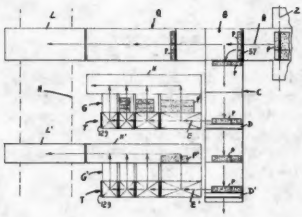
said tab portions adapted to be transversely moved relative to one another to nonresiliently deform said bight portion with said first and second sidewall portions defining in projection a configuration wherein axially aligned parts of the second edge segments of said first and second wall portions are transversely separated by a distance greater than the diameter of said apertures and said panel.

4,576,536

MACHINE FOR STACKING AUTOMATICALLY PACKS OF PANELS OF DIFFERENT SIZES ON RESPECTIVE LIFTING PLATFORMS

Gino Benuzzi, Bologna, Italy, assignor to Giben Impianti S.p.A., Pianoro, Italy

Filed Jun. 22, 1983, Ser. No. 506,939
Claims priority, application Italy, Jun. 24, 1982, 3461 A/82
Int. Cl.[4] B65H *31/24, 35/00*
U.S. Cl. 414—51 **20 Claims**



1. A machine for stacking automatically on respective lifting platforms packs of panels (P) of different sizes coming, for example, from a cutting line of a dividing machine (Z) having a working plane, comprising

(a) means (A) for removing, from a cutting line of a last said dividing machine, the packs of panels cyclically resulting from each dividing operation and arranged side by side;

(b) switching station means (B) for simultaneously and selectively feeding the packs of panels, arranged side by side, to a stacking machine (Q), or, after an optional 90° rotation of the packs, to a transport runway (C) where said packs will be arranged either side by side if they have been previously rotated, or in sequence;

(c) at least one lifting platform (T) arranged in one or more rows at right angles to said transport runway (C) to which said packs of panels are fed after said optional 90° rotation;

(d) means (D, D′) operating transversely of said transport runway (C), in registry with each lifting platform, to stop the packs of panels and to feed said packs of panels, in a single row and properly spaced apart, to receiving means (E, E′);

(e) said receiving means (E, E′) operating longitudinally above each row of lifting tables, and adapted to sort and stack softly said packs onto the platforms (T), so that

panels of the same size will be stacked at one time on each lifting platform; and

(f) means (G, H) for removing the stacks of panels formed on the lifting platforms.

4,576,537

ROBOT SYSTEM

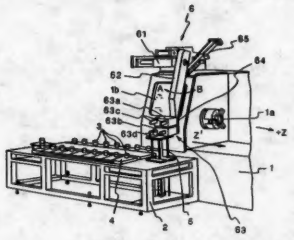
Hajimu Inaba, Hino, and Nobutoshi Torii, Hachioji, both of Japan, assignors to Fanuc Ltd., Mitamitsuru, Japan

Continuation-in-part of Ser. No. 396,613, Jul. 9, 1982, abandoned. This application Mar. 21, 1985, Ser. No. 714,345

Claims priority, application Japan, Jul. 14, 1981, 56-109567

Int. Cl.[4] B25J 9/00; B23Q 7/04

U.S. Cl. 414—222 2 Claims



1. A robot system for use with a machine tool having a spindle, comprising:

a robot having a body for being mounted on the machine tool, an arm pivotally mounted on said body and rotatable in a plane transverse to an axial direction of the spindle of the machine tool, and a hand mounted on a distal end of said arm for gripping a workpiece and transferring the workpiece to the machine tool;

a workpiece feeder disposed adjacent to said robot and movably supporting a succession of pallets for carrying unmachined and machined workpiece thereon, said workpiece feeder including a first mechanism for moving said pallets along a path on said workpiece feeder and for positioning said pallets, one at a time, in a first position in which an unmachined workpiece can be picked up from the pallet by said hand or a machined workpiece can be unloaded from said hand onto the pallet, and a second mechanism for moving the pallet toward said hand in said first position for allowing said hand to pick up the unmachined workpiece and unload the machined workpiece, and for moving said pallet away from said hand, and a DC motor for driving said second mechanism;

a first circuit for controlling said DC motor; and

a second circuit for controlling said first circuit on the basis of a distance L of movement of said pallet toward and away from said hand, said distance L being derived from the number N which is the maximum number of workpieces carried on said pallet, the distance Zn that said pallet with the N workpieces carried thereon moves until an uppermost workpiece reaches a second position in which the uppermost workpiece can be picked up by said hand, the distance Z1 that said pallet moves until a lowermost workpiece reaches said second position, and the number m of workpieces currently being carried on said pallet, said second circuit being capable of storing, in advance, data on said number N and said distances Zn, Z1 and monitoring said number m.

4,576,538

BOX CAR

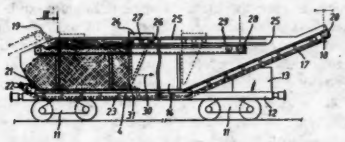
Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 15, 1983, Ser. No. 523,125

Claims priority, application Austria, Sep. 23, 1982, 3554/82; Mar. 11, 1983, 879/83

Int. Cl.[4] B65G 67/00

U.S. Cl. 414—339 14 Claims



1. A box car for storing bulk material and useful for incorporation in a freight train preceding a ballast cleaning machine for transporting waste material coming from the machine, the box car comprising a frame defining a plane, a box open on top and at the bottom, the box being mounted on the frame for storing the bulk material and having fixed input and output ends for respectively charging the bulk material into the box and discharging the bulk material from the box, a conveyor band arrangement forming a bottom wall of the box immediately below the open bottom and extending in the direction of elongation of the box car, the conveyor band arrangement having a width substantially equal to that of the lower box portion and comprising a first portion adjacent the input end and extending in the plane, the first portion being arranged to receive the bulk material charged into the box at the fixed input end, and an ascending portion extending in said direction from the first portion of the conveyor band arrangement and projecting beyond the output end, a drive means for the conveyor band arrangement, a bulkhead partition extending in the box transversely to said direction, the bulkhead partition being arranged above the first portion of the conveyor band arrangement, and means for displaceably moving said bulkhead partition in said direction for dividing the box into compartments, the bulkhead partition having a lower end fixedly spaced from the first conveyor band arrangement portion to define a port therewith.

4,576,539

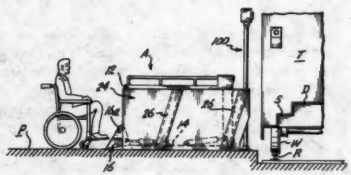
WHEELCHAIR PASSENGER LIFT APPARATUS FOR TRANSIT STATIONS

Harold R. Williams, Maple Valley, Wash., assignor to Lift-U-Inc., Kent, Wash.

Filed Jan. 17, 1984, Ser. No. 571,903

Int. Cl.[4] B66B 11/04

U.S. Cl. 414—391 14 Claims



1. A curbside lift for transferring wheelchair passengers between ground at curbside and the deck of a transit vehicle stopped with its pedestrian entryway aligned with said curbside lift comprising:

(a) a spaced pair of wall members defining a wheelchair

passenger corridor alignable with the entryway of a stopped transit vehicle, each of said wall members housing elongate guide tracks, the elongate guide tracks housed in one of said wall members being aligned with the elongate guide tracks housed in the other of said wall members;

(b) a lift car positioned between said wall members, said lift car including:

(1) a wheelchair platform; and,

(2) guided elements mounted on said wheelchair platform, said guided elements being mounted in said elongate guide tracks, said elongate guide tracks being positioned such that the combination of said elongate guide tracks and said guided elements controls the path of motion of said lift car between a lowered position substantially at ground level and a raised position substantially at transit vehicle deck level; and,

(c) elevator means for supporting the loaded weight of said lift car and raising and lowering said lift car between said lowered position and said raised position, said elevator means including:

(1) driven chain-engaging sprockets rotatably mounted on said lift car and positioned in said elongate guide tracks;

(2) driving means coupled to said driven chain-engaging sprockets for rotating said driven chain-engaging sprockets in synchronism;

(3) idler chain-engaging sprockets rotatably mounted and positioned in said elongate guide tracks; and,

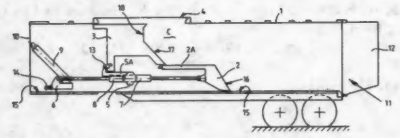
(4) stretches of roller chains mounted in said elongate guide tracks, said stretches of roller chains being sized and positioned such that a stretch of roller chain partially encircles a pair of chain-engaging sprockets formed from one of said driven chain-engaging sprockets and one of said idler chain-engaging sprockets, said stretches of roller chains partially encircling their respective pairs of chain-engaging sprockets such that a Z-shaped reversal of direction occurs as the roller chain wraps around the pair of chain-engaging sprockets.

4,576,540

DEVICE FOR COMPACTING CONTENTS OF HIGH CAPACITY SEMITRAILER BODY

Christian Derain, Conches, and Henri R. Saint-Marc, Evreux, both of France, assignors to Societe Nouvelle des Bennes Saphem, La Barre-en-Ouche, France

Filed Mar. 15, 1984, Ser. No. 589,837
Claims priority, application France, Mar. 16, 1983, 83 04313
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—511 **11 Claims**



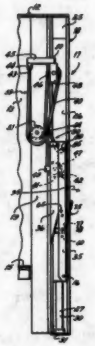
1. A compacting device located forwardly of a body, especially a closed body of a high capacity semitrailer for receiving by gravity mainly household or industrial waste products as well as any other products of low density, through an opening formed in a forward upper part of such body, comprising two parts moveable one with respect to the other including a compacting shield capable of moving above the bottom of the body and an apron capable of moving above said shield, controls of motions of said shield and said apron, in a first phase move, and of motion of said shield and said apron, in a second phase move, for total ejection of the waste products after transportation, and two other moveable supporting parts including a supporting carriage and a slider supporting said controls, said controls including jacks, one jack supported both on said supporting carriage and said shield, another jack supported on said supporting carriage and said slider, and a further jack supported on said slider and said body.

4,576,541

SAFETY LATCH FOR A CARGO PLATFORM

Jeffery L. Dunn, Covington, Ky., and Michael W. Durham, Milford, Ohio, assignors to Leyman Manufacturing Corp., Cincinnati, Ohio

Filed Feb. 29, 1984, Ser. No. 584,595
Int. Cl.[4] B60P *1/46*
U.S. Cl. 414—545 **13 Claims**



1. A cargo platform assembly comprising

a mast assembly having a mast guide and a mast movably supported by said guide,

a motor for moving said mast relative to said mast guide,

a platform pivotally connected to said mast, said platform being swingable relative to said mast between an open position and a closed position,

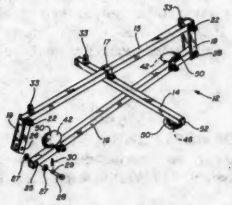
a flexible tension member having one end connected to said platform and the other end connected to said mast, and a compounding wheel rotatably mounted at a stationary position relative to ground, said compounding wheel and said flexible tension member being relatively selectively positionable between a first position where the tension member is engaged by the compounding wheel for swinging the platform between open and closed positions as said mast moves relative to said mast guide and relative to ground, and a second position where the tension member cannot be engaged by the compounding wheel when the mast is moved relative to the mast guide for raising and lowering the platform as an elevator, and

a safety latch having one portion mounted on said mast and another portion mounted on said cargo platform, one of said two portions of said safety latch being biased against said flexible tension member so that it is latchingly connected with the other of said two portions when said platform is in its closed position and when said tension member is relaxed to prevent swinging movement of said platform toward its open position, and so that when said tension member is taut one of said two portions of said safety latch is disconnected from the other of said two portions of said safety latch to permit swinging movement of said platform toward its open position from its closed position.

4,576,542
DEVICE FOR LIFTING REMOVABLE AUTOMOBILE TOPS

James M. Brasell, 20515 Marilyn La., Spring, Tex. 77388, and Ernest Nichols, Jr., 11610 Taylorcrest, Houston, Tex. 77024

Filed Apr. 23, 1984, Ser. No. 603,153
Int. Cl.[4] B66C 1/62
U.S. Cl. 414—626 20 Claims



1. Apparatus for lifting removable tops from vehicles comprising;

a frame releasably attachable to a vehicle top,

said frame having substantially parallel upper and lower members connected together and operable to be positioned with said lower member beneath said top and said upper member above said top,

a pair of supporting and lifting members supported in spaced relation along said lower frame member and extending upward therefrom for engaging the underside of the roof portion of said top,

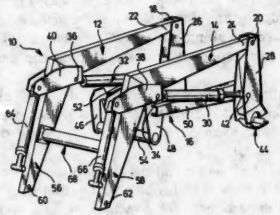
at least one member supported on said upper frame member and spaced laterally therefrom for engaging the top of the roof portion of said top, and

said pair of supporting and lifting members and said one engaging member being operable on application of an upward lifting force to lift said top and balance the same in an elevated position.

4,576,543
KNOCK-DOWN CONSTRUCTION FOR FRONT END LOADER

James R. Kuchyt, Fort Erie, and Paul G. High, St. Catharines, both of Canada, assignors to KMW Products Limited, St. Catharines, Canada

Filed Nov. 7, 1983, Ser. No. 549,065
Int. Cl.[4] B66F 9/00
U.S. Cl. 414—722 19 Claims



1. In a power loader arrangement having two spaced-apart boom members, a sub-frame assembly for mounting said boom members at their rearward portions on a power vehicle and at least one cross-member for mechanically interconnecting said boom members at their forward portions and maintaining a predetermined spacing therebetween, said sub-frame assembly including two side arms for positioning alongside a power vehicle and mechanically interconnected at their front portions to support vertical loads when in use, each boom member being hollow and having spaced-apart inner and outer plates secured together along corresponding upper and lower edges, means at each cross-member end portion for mechanically securing the respective cross-member end portions to the respective inner and outer plates,

said securing means comprising:

means associated with said inner plate of said boom arm and means associated with a respective end portion of said cross-member which are adapted to cooperate to resist shear and torsional forces exerted on said interconnection during usage of said loader,

means associated with said respective cooperating means of said boom arm and cross member end portion to provide for a transfer of a portion of said torsional and shear forces and longitudinal forces exerted along said cross-member during loader use from said inner plate to said outer plate of each boom arm and

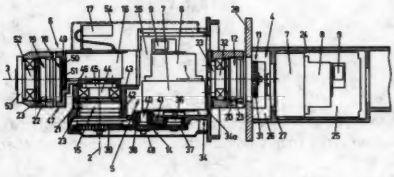
mechanically releasable fastener means at both end portions of said cross member for coupling said respective cooperating means and in conjunction with said

transfer means providing a secure interconnection, said mechanical securement of the at least one cross-member to said boom arms and the mechanical interconnection of the sub-frame providing for a compact disassembled loader arrangement.

4,576,544
SWIVELLING HANDLE WITH THREE AXES OF ROTATION FOR AN INDUSTRIAL ROBOT

Jean-Robert Passemard, Bailly Romainvilliers, and Gaston Keledjian, Boulogne Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Continuation of Ser. No. 417,851, Sep. 14, 1982, Pat. No. 4,527,945. This application Apr. 19, 1985, Ser. No. 724,896
Claims priority, application France, Sep. 15, 1981, 81 17426
Int. Cl.[4] B25J 17/02
U.S. Cl. 414—735 6 Claims



1. A swivelling handle for a robot arm, comprising:

an attachment element adapted to be connected to and end of a robot arm;

a first reduction gear assembly mounted in said attachment element and having an output shaft defining a first axis of movement;

a first motor and a first coding system mounted in said attachment element for driving said first reduction gear assembly, said first motor having an output shaft parallel to said first axis;

an intermediate element rotatably driven about said first axis by said first reduction gear assembly output shaft;

a second gear assembly mounted in said intermediate element and having an output shaft defining a second axis of movement;

a second motor and a second coding system mounted in said intermediate element for driving said second reduction gear assembly, said second motor having an output shaft parallel to said second axis;

an end element rotatably driven about said second axis by said second reduction gear assembly output shaft;

a third reduction gear assembly mounted in said end element

and having an output shaft defining a third axis of movement;

a third motor and a third coding system mounted in said end element for driving said third reduction gear assembly, said third motor having an output shaft parallel to said third axis;

a tool support rotatably driven about said third axis by said third reduction gear assembly output shaft; and

means for detecting an initial position of each of said reduction gear assembly output shafts,

wherein said second axis intersects both said first and third axes, and wherein said first, second and third axes are coplanar when said first and third axes are colinear.

4,576,545

WRIST OF ROBOT

Kenji Maeda, Funabashi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

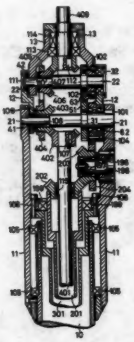
PCT No. PCT/JP82/00398, § 371 Date Jun. 7, 1983, § 102(e) Date Jun. 7, 1983, PCT Pub. No. WO83/01223, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 4, 1982, Ser. No. 503,142

Claims priority, application Japan, Oct. 7, 1981, 56-158843

Int. Cl.⁴ B25J *11/00*

U.S. Cl. 414—735 **5 Claims**



1. A wrist of a robot comprising at least a first wrist frame, a second wrist frame, and a nth wrist frame, characterized in that:

the first wrist frame of a first stage is attached to an arm of the robot;

the second wrist frame, located at a stage following that of the first wrist frame, is supported for pivotal movement with respect to the first wrist frame in such a manner that the intersection angle between the first wrist frame and the second wrist frame can be varied;

the nth wrist frame, located at a stage following that of the second wrist frame, is supported for pivotal movement with respect to the second wrist frame in such a manner that the intersection angle between the second wrist frame and the nth wrist frame can be varies;

a main stationary gear is affixed to the first wrist frame, said main stationary gear being disposed inwardly of the first wrist frame to which it is affixed and also inwardly of the second wrist frame, said main stationary gear being arranged concentrically with a first pivot axis for moving the second wrist frame of the next following stage in pivotal movement, and said main stationary gear being in meshing engagement, in a position inwardly of the second wrist frame, with an auxiliary stationary gear affixed to the nth wrist frame, said auxiliary stationary gear being arranged coaxially with a second pivot axis for pivotally moving the nth wrist frame to which said auxiliary stationary gear is affixed;

drive means for driving said second wrist frame to move in pivotal movement, said drive means being located inwardly of the first wrist frame;

said wrist frame at the first stage is connected to the arm of the robot in such a manner that the first wrist frame is moved in a rotating movement with respect to the arm of the robot by drive means located inside the arm; and

an output shaft of said drive means for pivotally driving the second wrist frame and an output shaft of said drive means for driving the first wrist frame to move in a rotating movement are located coaxially with respect to each other.

4,576,546

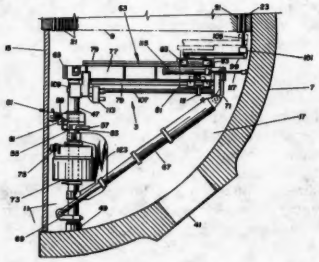
METHOD FOR SERVICING A STEAM GENERATOR

Frank W. Copper, Jr., and Raymond P. Castner, both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 311,712, Oct. 15, 1981. This application May 17, 1984, Ser. No. 611,262

Int. Cl.⁴ B25J *3/04*

U.S. Cl. 414—744 R **7 Claims**



1. A method of mapping the precise location of holes in a semicircular substantially planar tubesheet of a steam generator with a probe mounted on a carriage movable along an arm rotatable in a plane parallel to the tubesheet and wherein said holes are arranged in rows and columns with a first nominal distance between centers along rows and a second nominal distance between centers on the columns, said method comprising the steps of:

(a) generating signals to maneuver the angular position of the arm and the position of the carriage along the arm to generally align the probe with one of said holes;

(b) adjusting the angular position of the arm and the position of the carriage along the arm in response to signals generated by the probe to precisely locate the center of the hole;

(c) generating signals representative of the precise location of the center of the hole from the angular position of the arm and the location of the carriage along the arm and storing the same;

(d) generating signals to adjust the positions of the arm and carriage to move the probe a first preselected distance in a direction parallel to the row to generally align the probe with another hole in the row;

(e) repeating steps b, c and d until the precise location of each hole at said preselected distances in the row has been generated and stored;

(f) generating signals to adjust the position of the arm and carriage to move the probe a second preselected distance parallel to the columns and to generally align the probe with a hole at less than said first preselected distance from one end of another row;

(g) repeating steps b through e;

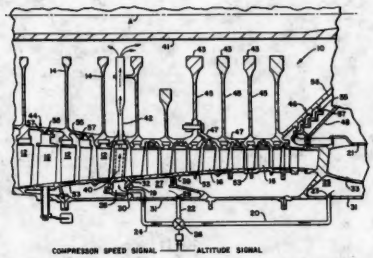
(h) repeating steps f and g until all of the holes spaced at said preselected distances have been precisely located.

4,576,547

ACTIVE CLEARANCE CONTROL

Harvey I. Weiner, South Windsor, Conn., and Kenneth L. Allard, Wilbraham, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1983, Ser. No. 548,466
Int. Cl.[4] F02C 7/16
U.S. Cl. 415—116 4 Claims



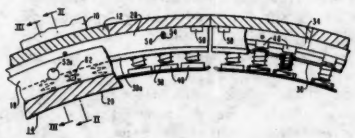
1. An active clearance control for a gas turbine engine powering aircraft over and operating envelope including high powered and low powered conditions, said engine having a compressor section comprising a plurality of stages of axial compressors rotatably supported in the bore area of the compressor section, each of said stages including a plurality of blades supported in a disc and each blade having a tip, an air seal circumscribing the tips of said blades and defining a gap between said tips and said air seal, and a row of stator vanes mounted ahead of the blades, means for selectively bleeding compressed air from one of said stages substantially at the middle of said stages and at another of said stages downstream therefrom relative to the air flow through said stages, means for feeding said bled air into the bore area adjacent the rotating axis of said plurality of stages of axial compressors, said feeding means including at least one hollow stator vane in one of said rows of stator vanes, and an anti-vortex tube extending from the inner diameter of the hollow stator vane radially inward toward said rotating axis, and control means for modulating said selective bleeding means for admitting compressed air to said bore by said feeding means to heat said discs so that said discs expand toward the air seal and close said gap between said air seal and the tips of said blades during the lower powered condition of said engine.

4,576,548

SELF-ALIGNING STATIC SEAL FOR GAS TURBINE STATOR VANES

Jan P. Smed, West Chester, Pa.; Kenneth E. Seitzer, Tempe, Ariz., and Kent G. Hultgren, Swarthmore, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 17, 1984, Ser. No. 571,612
Int. Cl.[4] F01D 11/08
U.S. Cl. 415—137 6 Claims



1. An arrangement for statically sealing between the inner shrouds of an annular array of stationary stator vanes and a radially-inner, annular seal housing of a gas turbine, comprising:

first, outer seal means carried by said housing and comprising a first plurality of arcuate segments in end-to-end relation substantially completing a circle, each said segment being generally channel-shaped in cross section throughout its length, and being radially movably disposed in a radially-outwardly-open channel in said housing;

second, inner seal means radially movably disposed in said first seal means channel and including a second plurality of arcuate segments equalling the number of said shrouds, in end-to-end relation substantially completing a circle;

first resilient means biasing said first seal means radially outwardly in said housing channel; and

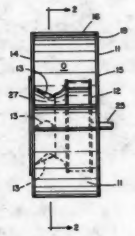
second resilient means independently biasing said second seal means radially outwardly in said first seal means channel.

4,576,549

VORTEX GENERATOR FOR CENTRIFUGAL FANS

Robert L. Lanier, Niles, Mich., assignor to Garden City Fan & Blower Co., Niles, Mich.

Continuation of Ser. No. 165,767, Jul. 3, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 470,398
Int. Cl.[4] F04D 17/08
U.S. Cl. 415—209 10 Claims



1. A centrifugal fan comprising:

(a) a scroll type housing,

(b) a bladed fan-wheel mounted for rotational movement within said housing said fan-wheel having a side plate with an axial air-inlet to the wheel,

(c) an air-inlet in one wall of the housing,

(d) an annular member connecting the housing inlet with the fan-wheel air-inlet,

(e) a series of formed vortex generators secured to the outer wall of the annular member in circumferentially spaced apart relation between the air-inlet wall of the fan-wheel and the air-inlet housing wall with the axial ends spaced a short distance from said walls, said vortex generators having a spine in substantial alignment with the axis of the fan-wheel and having a continuous surface defined within a closed circumference, the circumference being substantially in tight engagement with the exterior surface of the annular element wherein air is restricted from entry into the interior of the vortex generator, the vortex generators having a profile defined above the level of the annular member and along the axis of the spine, said profile having a maximum displacement from the annular member intermediate said axial ends and said profile decreasing to substantially zero at both ends of the vortex generators whereby the vortex generators interrupt an air current created by skin friction of the air-inlet wall of the fan-wheel as the current passes axially outward over the annular member, the vortex generator creates turbulence and mixing between the slower moving air current discharged from the wheel blades and the air current created

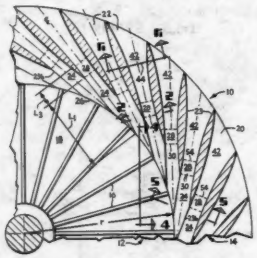
by skin friction of the air-inlet wall of the fan-wheel but without interfering with the recirculation of air between the air-inlet of the fan-wheel and the innermost portion of the annular inlet, restricting the recirculation of the velocity air currents within the housing by causing mixing thereof with slower velocity air discharged from the fan outlet.

4,576,550

DIFFUSER FOR A CENTRIFUGAL COMPRESSOR

Alexander C. Bryans, Reading, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 2, 1983, Ser. No. 557,561
Int. Cl.[4] F04D *29/44*
U.S. Cl. 415—211 **20 Claims**



12. In a diffuser of a centrifugal compressor including an impeller, said diffuser including a plurality of tangentially disposed passages each having a throat portion of cross-sectional area A, the improvement comprising:

said throat portion having a quadrilateral cross section defined by two substantially parallel opposing linear sidewalls and two substantially arcuate opposing sidewalls, said two linear sidewalls being spaced from each other to define a minor dimension extending therebetween, said two arcuate sidewalls being sapced from each other to define a major dimension therebetween, said major dimension being greater in length than said minor dimension, and said linear sidewalls being disposed substantially normal with respect to a radial axis of said diffuser.

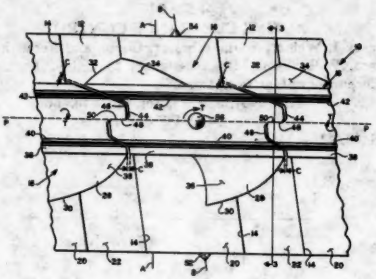
4,576,551

TURBO MACHINE BLADING

Paul D. Olivier, Scottsdale, Ariz., and Lester E. Chadbourne, deceased, late of Scottsdale, Ariz. (by Mary T. Chadbourne, personal representative), assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 17, 1982, Ser. No. 389,519
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—191 **15 Claims**

1. On a turbo machine blade wheel, a multitude of circumferentially disposed fluid energy reactive blade members engaging one another only at abutment surfaces defined thereon



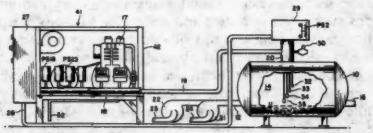
which lie in a transverse radial plane relative to the rotational axis of said blade wheel.

4,576,552

AIR AND WATER VOLUME CONTROL APPARATUS FOR HYDROPNEUMATIC TANKS

Dresden G. Smith, 1621 English Dr., San Jose, Calif. 95129

Filed May 6, 1985, Ser. No. 730,438
Int. Cl.[4] F04B *41/06*
U.S. Cl. 417—2 **6 Claims**



1. A hydropneumatic tank control for a water supply system having a closed water tank with a water inlet and outlet, an air compressor to supply pressurized air through a manifold and into said tank and a water pump connected to a water supply to supply water to said tank, said control comprising:

a tank adapter mounted directly on said water tank,

a first pressure limit switch mounted on said manifold to detect a low and high air pressure threshold in said tank,

a second pressure limit switch mounted on said manifold to detect a low air pressure threshold in said tank,

a first water level electrode for detecting a high water level threshold in said tank,

a first circuit means for energizing said water pump in response to said first pressure limit switch detecting a low air pressure threshold and deenergizing said water pump when said first pressure limit switch detects a high air pressure threshold in said tank,

a second circuit means for energizing said water pump in response to said second pressure limit switch detecting a low air pressure threshold in said tank and deenergizing said pump in response to said first water level electrode detecting a high water level threshold in said tank,

means to connect the first or second circuit means in said control exclusively to select the mode in which the water pump is controlled,

a third pressure limit switch located in said tank adapter to detect when the air pressure in said tank exceeds a dangerous pressure level threshold, and

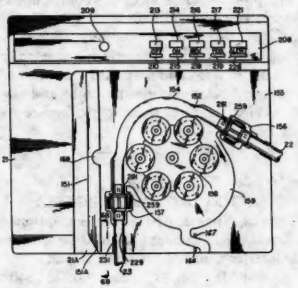
a third circuit means for deenergizing said first and second circuit means responsive to the third pressure limit switch detecting a dangerous pressure level in said tank.

4,576,553

PAINTING APPLICATOR WITH REMOTE SUPPLY

Walter E. Winston, Carmel, and Lowell G. Atkinson, Indianapolis, both of Ind., assignors to Black & Decker Inc., Newark, Del.

Division of Ser. No. 218,354, Dec. 22, 1980, Pat. No. 4,424,011.
This application Dec. 23, 1983, Ser. No. 564,724
Int. Cl.[4] F04B 49/10
U.S. Cl. 417—9 2 Claims



1. In painting apparatus, paint mover means comprising:
a pump housing;
a pump in said housing and including a pump face, a paint pumping tube, a tube support cam, pumping roller carrier means, pumping rollers circularly spaced on said carrier means, and motor means for driving said roller carrier means;
leakage detection means in said housing and including a leakage directing passageway in said pump face, and photoelectric sensor means and light source means associated with said passageway;
said pump face being comprised principally of upstanding horizontally facing surfaces, and including a cavity receiving said pumping tube, said passageway communicating with the lowermost point in said cavity and extending downward therefrom;
said passageway having a horizontally extending portion;
said light source means comprising a light emitter at the bottom of said portion; and
said photoelectric sensor means including a light sensitive receiver above said emitter for interference with light passage from said emitter to said receiver by leakage paint in said portion.

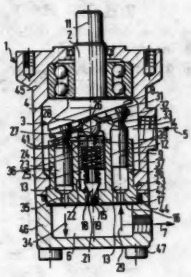
4,576,554

SWASHPLATE AXIAL PISTON PUMP

Ludwig Wagenseil, Vöhringen, and Manfred Lotter, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,106
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340333
Int. Cl.[4] F04B 1/28
U.S. Cl. 417—270 13 Claims

1. A swashplate axial piston pump comprising a housing including a suction chamber and a discharge chamber, a pump block extending inside the housing and including a plurality of piston bores, a plurality of pistons supported for reciprocating movement in the piston bores, each piston including a piston head, a swashplate supported in the housing to reciprocate the piston, a retraction plate for holding the piston heads against the swashplate, a pressure-regulating valve assembly in communication with the suction and discharge chambers to conduct fluid therebetween, said valve assembly including a valving body disposed centrally between the pistons to control fluid flow through the valve assembly, and moving to a position opening the pressure-regulating valve assembly when the pressure in the discharge chamber exceeds the pressure in the suction chamber by a predetermined pressure; and
means consisting of a single spring disposed and clamped



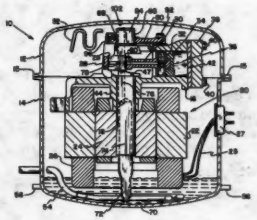
between the valving body and the retraction plate, and both urging the retraction plate to a position securely holding the piston heads against the swashplate and simultaneously urging the valving body to a position closing the pressure-regulating valve assembly.

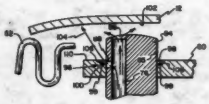
4,576,555

OIL DISPERSING DEVICE

Roger N. Ashenfelter, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 13, 1984, Ser. No. 670,314
Int. Cl.[4] F04B 39/02, 39/06
U.S. Cl. 417—372 13 Claims





1. In a hermetic compressor including a housing and rotatable vertical crankshaft and a bearing for journalling said crankshaft, means for cooling compressor lubricant oil comprising:
an axial bore in said crankshaft;
means for pumping oil from an oil sump upwardly through said bore;
an annular cavity in said bearing concentric with and surrounding said crankshaft, said cavity being open upwardly through substantially 360° towards said housing and defining a circumferential shoulder spaced radially outwardly from the outer surface of said crankshaft; and
a radial passage in said crankshaft, said passage open at one end to said bore and open at the other end to said cavity, whereby oil passes radially outwardly through said pas-

sage into said cavity as said crankshaft rotates and is deflected upwardly through substantially 360° towards said housing by said shoulder.

4,576,556

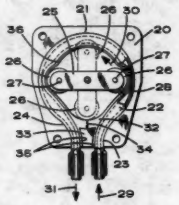
ROLLER PUMP

Howard J. Thompson, New Richmond, Wis., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 2, 1980, Ser. No. 136,812

Int. Cl.[4] F04B *43/12*

U.S. Cl. 417—477 **2 Claims**



1. In a medical roller pump of the type having a stator, including hose inlet and outlet means and a generally arcuate bearing surface, having hose means extending from said hose inlet means to said hose outlet means along said bearing surface, and having rotor means rotatable through 360°, said rotor means carrying a plurality of roller means for compressing said hose means against said bearing surface, the improvement which comprises shim means including backing support means in generally opposing relation to said bearing surface for imparting a hose compression counterbalancing force to said rotor means thereby equalizing the forces imparted to said rotor means throughout its 360° rotation.

4,576,557

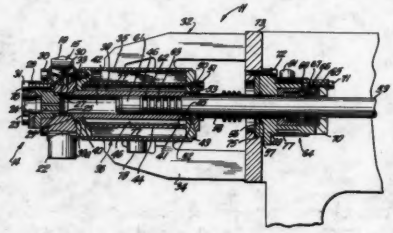
CRYOGENIC LIQUID PUMP

Boris Pevzner, Williamsville, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 15, 1983, Ser. No. 504,435

Int. Cl.[4] F16J *10/02*; F04B *15/06*

U.S. Cl. 417—539 **27 Claims**



1. In a reciprocating-type pump adapted for the pumping of cryogenic liquids and including at least one: (1) pump body having a forward end, a rearward end and a cylindrical bore forming a pumping chamber therein; (2) power frame having a crank shaft comprising the driving means for said pump; (3) reciprocating plunger means connected to the crank shaft of said power frame and extending into the pumping chamber of said pump body through the rearward end thereof and adapted for reciprocating motion therein; (4) valve means in fluid communication with the pumping chamber and adapted for controllably introducing cryogenic liquid into the pumping chamber during each suction stroke of said plunger and for controllably discharging cryogenic liquid from the pumping chamber during each discharge stroke thereof; and (5) sealing means surrounding said plunger means for sealing the pump against fluid leakage, the improvement comprising a unitary, rigid pump body support structure connected to said power frame, said unitary support structure having a forward end pump body mounting plate, a rearward pump body mounting plate spaced apart from said forward plate, and a power frame mounting plate, said plates being secured together in permanent, non-mechanical joining by means of rigid connecting members, said plates having bores therein for each pump body secured thereto and for said sealing means, whereby said unitary support structure can be precisely aligned with and securely connected to said power frame, each pump body mounted on said forward and rearward mounting plates advantageously being of relatively light weight and size providing overall cost savings and enhanced performance capability for said pump.

4,576,558

SCREW ROTOR ASSEMBLY

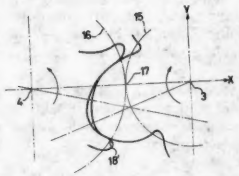
Masanori Tanaka, Niigata; Atsushi Maehara, Bunsuimachi, and Junichi Kanai, Yoshidamachi, all of Japan, assignors to Hokuetsu Industries Co., Ltd., Niigata, Japan

Filed Mar. 21, 1985, Ser. No. 714,540

Claims priority, application Japan, Apr. 7, 1984, 59-69699

Int. Cl.[4] F01C *1/16*

U.S. Cl. 418—150 **1 Claim**



1. A screw rotor assembly, comprising:

a male rotor (1) having hellical lands and a female rotor (2) having helical grooves which mesh with each other and rotate about two parallel axes, a major portion of each tooth profile of said female rotor being formed inside a pitch circle of said female rotor, and a major portion of each tooth profile of said male rotor being formed outside a pitch circle of said male rotor, wherein in a plane perpendicular to rotating axes of said rotors:

a tooth profile of said female rotor (2) is formed such that a first curve (H_2-A_2) connecting an outermost point (H_2) at a tip of an addendum (Af) and a first point (A_2) located on the pitch circle is a generated curve of a second point (A_1) located on the pitch circle of the male rotor tooth profile; a portion between said first point (A_2) and a third point (B_2) is formed by a first circular arc having a first radius (R_7) and a center (O_7) of said first arc which is located on a line tangent to the pitch circle of the female rotor at said first point (A_2) and located outside the concave of the groove; a portion between said second point (B_2) and a fourth point (C'_2) is formed by a first envelope (B_2-C_2) developed by a second circular arc (B_1-C_1) which is a part of the male rotor tooth profile; a portion between fifth and sixth points (D'_2) and (E_2) is formed by a third circular arc (D'_2-E_2) having a second radius (R_1) and a center (O_1) of said third arc is located on a line (3-4) connecting centers of rotation of said male and female rotors and outside the pitch circle of said female rotor; a portion between said fourth and fifth points (C'_2) and (D'_2) is formed by a common tangent of the first envelope (B_2-C'_2) and said third circular arc (D'_2-E_2) and connected with said third arc (D'_2-E_2) at the fifth point (D'_2); a portion between the sixth point (E_2) and a seventh point (F_2) is formed by a

fourth circular arc (E_2-F_2) connected with the third arc (D'_2-E_2) at the sixth point (E_2) and having a radius (R_2) and a center (O_2) of a fifth arc located on an extension of a line (O_1-E_2) intersecting at an angle (O_1) with said line (3-4) passing through the centers of the rotors and connecting the centers of rotation of said male and female rotors at a position opposite to the center (O_1) of the third arc (D'_2-E_2) with respect to the sixth point (E_2); and a portion between the sixth point (F_2) and a seventh (G_2) is formed by a sixth circular arc (F_2-G_2) connected with a seventh circular arc (G_2-H_2) having a radius equal to the outer diameter of said female rotor at an eighth point (G_2) and having a radius (R_8) and a center (O_8) of the arc being located on a line connecting the center (O_2) of the fourth arc and the seventh point (F_2) and located outside of the groove of the female rotor tooth profile; and

a tooth profile of the male rotor (1) is formed such that a second curve (H_1-A_1) connecting a ninth point (H_1) located on a bottom land of a dedendum (Dm) and said second point (A_1) located on said pitch circle is a generated curve of a tenth point (H_2) located on the female rotor tooth profile, a portion between said second points (A_1) and third (B_1) is a second envelope developed by an eighth arc (A_2-B_2) which is a part of the female rotor tooth profile; a portion between an eleventh point (B_1) and a twelfth (C_1) is formed by a circular arc (B_1-C_1) connected with said second envelope (A_1-B_1) at said eleventh point (B_1) and having a radius (R_4) and a center O_4 of the second arc located on a line intersecting at an angle (θ_{r5}) with said line (3-4) connecting the rotating centers (3, 4) of said male and female rotors (1, 2) and located at a predetermined distance from said line (3-4) connecting the rotating centers of said male and female rotors (1, 2); a portion between said twelfth point (C_1) and a thirteenth point (D_1) is formed by a circular arc (C_1-D_1) having a radius (R_5) and a center of the arc (3) at the rotating center of said male rotor; a portion between the thirteenth point (D_1) and a fourteenth point (E_1) is formed by a third evelope (D_1-E_1) developed by a ninth arc (D_2-E_2) which is a part of the female rotor tooth profile; a portion between the fourteenth point (E_1) and a fifteenth point (F_1) is formed by a fourth envelope (E_1-F_1) developed by a tenth arc (E_2-F_2) which is a part of the female rotor tooth profile; a portion between the points (F_1) and G_1) is formed by a fifth envelope (F_1-G_1) developed by the arc (F_2-G_2); and tooth profiles of said male and female rotors (1, 2) are formed by smoothly and tangentially connecting said arcs and curves.

4,576,559

VENTED TIRE MOLDING MOLD

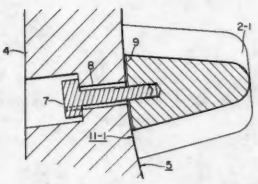
Yasutada Yoča; Seisuke Sueyasu; Michihiro Orikawa, all of Higashimurayama, and Shoji Futamura, Kawasaki, all of Japan, assignors to Bridgestone Tire Co. Ltd. and Institute of Technology Precision Electrical Discharge Works, both of Japan

Continuation of Ser. No. 566,716, Dec. 29, 1983. This application Jun. 24, 1985, Ser. No. 748,143

Claims priority, application Japan, Dec. 29, 1982, 57-231912; Dec. 29, 1982, 57-231913

Int. Cl.⁴ B29H *5/02*

U.S. Cl. 425—28 R **10 Claims**



1. A tire molding mold comprising a mold body having an inner circumferential surface corresponding to the contour of a tire to be molded, including at least the tread thereof, and mold attachments each having a surface mating with said inner circumferential surface and for forming recesses of the tire to be molded, and characterized in that each mold attachment is made of a metal block and is joined and mated with said inner circumferential surface of said mold body and detachably fitted to said mold body, and wherein venting gaps are provided on said surface of said mold attachments which mates with said circumferential surface so as to be in the mating surface of and underlie said mold attachments, said mold attachments having outer surfaces which include no portion of said inner circumferential surface of said mold body and no portion of said contour of said tire to be molded.

4,576,560

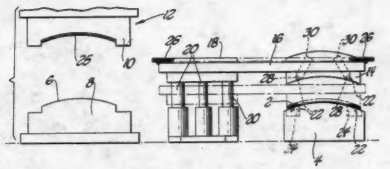
SMC LOADER FOR COMPRESSION MOLDING PRESS

Edmund A. Herman, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1984, Ser. No. 671,767

Int. Cl.⁴ B29C *43/34*

U.S. Cl. 425—103 **6 Claims**



1. An apparatus for automatically delivering sheet molding compound (SMC) into a compression press having top and bottom molds between which the SMC is molded comprising a buck for forming the SMC in the molding configuration before it is delivered into the mold; a plurality of pins which are mounted in a plate of a shape conforming substantially to said buck; means to reciprocate said pins between extended and retracted positions such that in the extended position they can pierce the SMC and pick it up from the buck and retain it as it is moved into the mold and such that in the pin retracted position the SMC can be dropped onto the bottom mold in the compression press and means to lift and transfer said compound from above said buck to above said mold.

4,576,561

DEVICE FOR ADJUSTING THE HEIGHT OF BUILDING BLOCKS

Yves Van de Caveye, Waterloo, Belgium, and Henri Schaeflé, Clermont, France, assignors to Hanota Holdings S.A., Luxembourg, Luxembourg

PCT No. PCT/BE82/00016, § 371 Date Feb. 18, 1983, § 102(e) Date Feb. 18, 1984, PCT Pub. No. WO83/00028, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 11, 1982, Ser. No. 467,830

Claims priority, application Belgium, Jun. 22, 1981, 205169

Int. Cl.⁴ B28B *11/04*

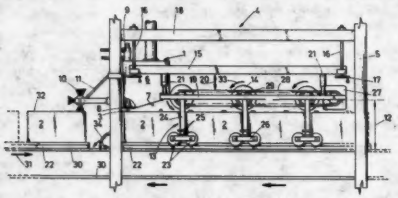
U.S. Cl. 425—104 **20 Claims**

1. In a device for adjusting to a predetermined height building blocks and similar blocks, notably hollow blocks to be laid dry upon one another, said blocks having been formed in a mould and then unmoulded, which comprises a metering means for laying over a top of a succession of said unmoulded blocks an amount of material which is hardenable and bindable thereon, a levelling means for tamping down said material over the blocks for imparting to said blocks a total height which substantially corresponds to said predetermined height, and conveyor means adapted for moving the blocks from the mould inside which said blocks are formed and through said levelling means, an improved levelling means comprising,

a levelling member spaced above a location wherein said unmoulded blocks are brought by the conveyor means to

tamp down the material laid down on said blocks by said metering means, and

guiding means cooperating with a top surface directly bearing the blocks to be adjusted for spacing said member at a



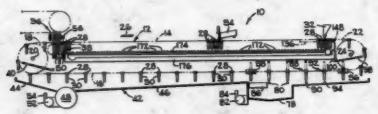
fixed distance relative to and in accordance with the bottom of the blocks which substantially corresponds to said predetermined height, during the levelling of said material laid over the blocks.

4,576,562

APPARATUS FOR PRODUCING FROZEN CONFECTIONS

David N. Anderson, Lakeland, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 27, 1984, Ser. No. 604,776
Int. Cl.[4] A23G *9/26, 9/30*
U.S. Cl. 425—126 S **21 Claims**



1. In an apparatus for producing frozen confections, the improvement comprising;

a pair of endless laterally spaced chains traveling in a closed path defining upper and lower horizontal reaches;

means for intermittently advancing said chains;

elongate mold bars formed with a plurality of cavities for retaining confection material;

means for pivotally connecting the ends of said mold bars to every other pin connection of the links of said chains so that the mouth of the cavities face upwardly during movement in the closed path, means for decreasing and maintaining constant the pitch of said chains during their passage along the upper reach of the closed path.

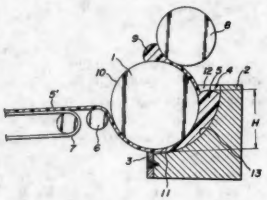
4,576,563

ROTARY ROLL-TYPE RUBBER EXTRUDER

Jumei Harada, Kodaira; Keiji Yamamoto, Tokorozawa, and Takashi Yokoi, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,752
Claims priority, application Japan, Dec. 21, 1983, 58-239682
Int. Cl.[4] B21C *23/32*
U.S. Cl. 425—194 **4 Claims**

1. A rotary roll-type rubber extruder including a roll having an outer cylindrical surface rotatively driven by driving means, a housing having a stationary concave surface spaced from and in opposition to the rotating outer cylindrical surface of said roll between a pair of sidewalls close to said outer cylindrical surface of the roll to form a define chamber with the roll, and a mouthpiece detachably secured to said housing to form a defined extruding opening with said roll at an outlet of said defined chamber, wherein said concave surface of said housing is constructed such that with a rubberlike material being supplied with the same rubberlike material to meet amounts of the material extruded from said mouthpiece under action of the atmospheric pressure at an inlet of said defined chamber opposite to said mouthpiece, pressure gradients at mouthpieces in extruding the rubberlike material having thicknesses of 1–5 mm are within a quadrilateral area having four



corners, said corners corresponding to pressure gradients 65 and 150 (kg/cm^3) at a 1 mm opening mouthpiece and pressure gradients 11 and 23 (kg/cm^3) at a 5 mm opening mouthpiece in a graph having an ordinate in logarithm showing the pressure gradients

$$\left(-\frac{dP}{dX}\right)$$

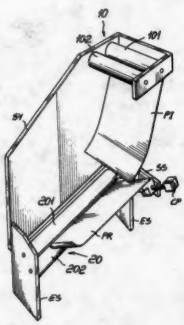
and an abscissa in logarithm showing heights (mm) of openings of the mouthpieces.

4,576,564

DEVICE FOR SPREADING LAYERS OF DOUGH OF CIRCULAR SHAPE FROM DOUGH MASSES OF NEAR SPHERICAL SHAPE

Dario Bernardi, Via Mazzini, 5 - Cattolica (Province of Forli), and Maurizio Pettinari, Viale Puglia, 14 - Riccione (Province of Forli), both of Italy

Filed Feb. 15, 1984, Ser. No. 580,488
Claims priority, application Italy, Feb. 17, 1983, 44010 A/83
Int. Cl.[4] A21C *3/02*
U.S. Cl. 425—337 **1 Claim**



1. A device for spreading out amounts of dough of near spherical shape into layers of circular shape comprising one first pair of rolling rollers, one second pair of rolling rollers arranged at a lower level and at right angle with respect to said first pair, a sloping plane having an upper and a lower portion, said upper portion being arranged under said first pair of rollers for taking up a dough layer getting out of said first pair, a rotatable tray arranged below said lower portion and tiltable around a horizontal axis parallel to said second pair of rollers

between a first initial position whereat said rotatable tray is aligned with said lower portion of the sloping plane to receive an amount of dough after being passed the first pair of rollers and a second position whereat said rotatable tray is aligned with said second pair of rollers to introduce the amount of dough therebetween, a counterweight being associated to said tray for returning the latter from said second to the initial position.

4,576,565

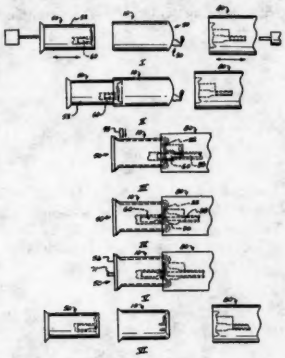
APPARATUS FOR FORMING A DISPENSING CONTAINER

Walter K. Chlystun, 327 St. James Dr., Spartanburg, S.C. 29301

Division of Ser. No. 131,248, Mar. 17, 1980, Pat. No. 4,529,108. This application Nov. 19, 1984, Ser. No. 673,140

Int. Cl.⁴ B29C *51/08, 51/30*

U.S. Cl. 425—383 **15 Claims**



1. Apparatus for reforming a portion of a container, said portion having been molded of a thermoplastic polymeric material, comprising:

(a) a first mandrel, said first mandrel having a body, said body having a die recess at an end of said body defining a contour of one side of a pressure dome section to be formed in said molded container portion said body of said first mandrel further having means adjacent an end of same opposite said die section to make sealing engagement with an open end of said container, and further has at least one fluid passageway therein, whereby after a seal is produced between said mandrel body and said open end of said container, fluid under pressure may be admitted to said fluid passageway to pressure test said container;

(b) a male mandrel, said male mandrel having a body, said body having a die section at an end of said body, said male mandrel die section defining a contour of an opposite side of a pressure dome section as defined by said die recess on said first mandrel, said die section of said male mandrel extending at least partially along the side of said die section in said first mandrel when said mandrels are in registry with a container portion therebetween; and

(c) means for moving said mandrels into and out of registry.

4,576,566

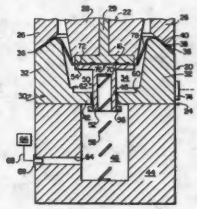
APPARATUS FOR FORMING A PAPERBOARD RECEPTACLE

Paul O. Hain, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 550,512, Nov. 10, 1983, abandoned, which is a continuation of Ser. No. 408,477, Jul. 16, 1982, abandoned, which is a division of Ser. No. 217,092, Dec. 16, 1980. This application Jan. 31, 1985, Ser. No. 697,415

Int. Cl.⁴ B29C *17/00*

U.S. Cl. 425—400 **5 Claims**



1. An apparatus for drawing a flat paperboard blank to form a dished receptacle having corner areas of maximum stress, during drawing, at the juncture of the receptacle base and sidewall structure, and apparatus comprising:

(a) a male die having a central plunger portion for engaging a central portion of the blank and having a peripheral portion for engaging a peripheral portion of the blank;

(b) a female die having a peripheral portion for engaging a peripheral portion of the blank and having a central cavity into which a central portion of the blank is drawn;

(c) means forming a steam cavity adjacent said female die;

(d) means for introducing steam into said steam cavity;

(e) a passage extending between said female die cavity and said steam cavity;

(f) a reciprocating plunger disposed in said female die cavity, said reciprocating plunger having a portion extending through said passage and into said steam cavity, said reciprocating plunger being removable between first and second positions;

(g) means on said reciprocating plunger operable to close said passage when said reciprocating plunger is in said first position; and

(h) said male die having means operable when extended into said female die cavity to move said reciprocating plunger to said second position to allow passage of steam into said female die cavity to impinge, upon and thereby plasticize and lubricate areas of the blank which are subject to maximum stress during drawing of the blank.

4,576,567

INJECTION MOLDING SYSTEM HAVING AN INSULATION SLEEVE

Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada L7G 2X1

Filed Sep. 29, 1983, Ser. No. 537,054

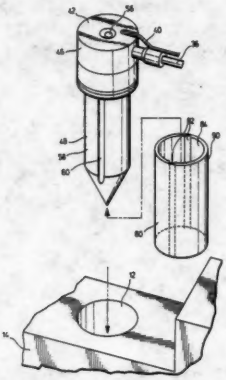
Claims priority, application Canada, Sep. 12, 1983, 436502

Int. Cl.⁴ B29C *45/03*

U.S. Cl. 425—549 **7 Claims**

1. In a hot runner injection molding system with a hot runner passage extending to convey pressurized melt from a molding machine to a gate in a cooled cavity plate leading to a cavity, and having an integral elongated heated probe seated in a well in the cavity plate, the probe having an outer surface and the well in the cavity plate having a wall which extends around said outer surface to form a space therebetween, the probe having at least one generally longitudinally extending melt channel which the hot runner passage extends, the improvement wherein the outer surface of the probe has at least one

longitudinally extending outwardly open groove, and a thermal insulating sleeve is located in the space between the probe and the cavity plate, the insulating sleeve having an inner surface abutting the outer surface of the probe, the inner surface of the sleeve having at least one longitudinally extending



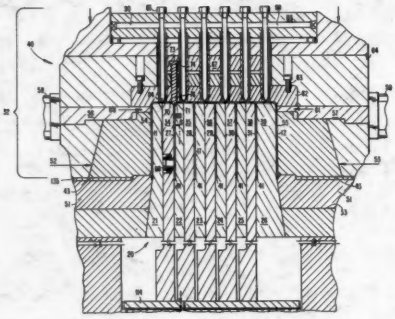
inwardly open groove which is in alignmemt with said outwardly open groove extending along the outer surface of the probe to form at least a portion of the melt channel, the insulating sleeve being formed of a plastic material having a melting temperature substantially higher than that of the melt.

4,576,568

INJECTION MOLD WITH THIN WALL HOLE FORMING MEANS

Walter A. Grannen, III, Bargersville, Ind., assignor to E-W Mold & Tool Company, Inc., Indianapolis, Ind.

Filed Feb. 25, 1985, Ser. No. 705,130
Int. Cl.[4] B29C *1/06*; B29F *1/022*
U.S. Cl. 425—577 **15 Claims**



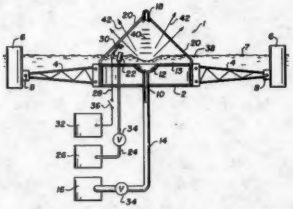
1. A case mold assembly comprising:
a frame;
a female mold mounted on said frame and having a cavity for the plastic injection molding of a case;
a male mold mounted on said frame and positionable into said female mold for a first time period for the formation of said case therebetween, said male mold including a plurality of cores located apart forming spaces, said cores having bottom ends mounted to said frame with said cores extendable into said cavity to form interior walls extending across said case upon said plastic injection;
injection means operable to inject molten plastic between said female mold and said male mold and into said spaces and to maintain said plastic under pressure for a second time period of a duration less than said first time period;
wedge lock means mounted to said female mold and extending between said cores and into said spaces operable to limit relative motion between cores during said plastic injection but being movable apart from said cores to allow said molten plastic under pressure to fill spaces vacated by said wedge lock means;
a plurality of lifters slidable mounted on said cores and extending into said cavity;
a plurality of pins mounted to said lifters and extending laterally across said spaces toward adjacent cores forming holes through said interior walls as said spaces between cores are filled with plastic;
pin control means associated with said cores, said lifters and said pins being operable to cause said pins to extend outwardly into said spaces to form said holes within said walls and to allow said pins to withdraw into said cores from said spaces upon expiration of a third time period subsequent to said second time period; and,
timing means operably associated with said injection means and said lifters and being operable to establish said second time period during which said pressure is maintained in said spaces and to establish said third time period during which said molten plastic cools to a non-flowable state and upon expiration thereof said lifters slide relative to said cores retracting said pins and forming said holes.

4,576,569

APPARATUS TO REMOVE OIL SLICKS

John N. Koblanski, Burnaby, Canada, assignor to Ocean Ecology Ltd., Vancouver, Canada

Filed Nov. 29, 1984, Ser. No. 676,373
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 **25 Claims**

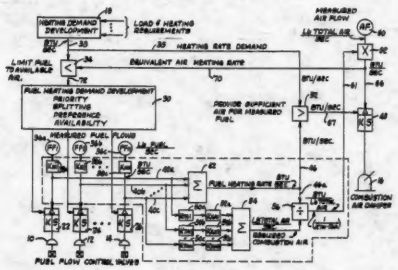


1. Apparatus to burn a combustible pollutant floating on the surface of a body of water the apparatus comprising:
a first body;
buoyancy means to maintain the first body beneath the surface of the water;
a first chamber in the first body;
a resonation chamber, fixed relative to the surface of the first body and above the first chamber and positioned to be above the surface of the water when the apparatus is in use;
means to project a high velocity fluid up from the first body and through said chamber to the resonation chamber to develop a shock wave that is directed back towards the pollutant to atomize the pollutant; and
means to combust the atomized pollutant.

4,576,570
AUTOMATIC COMBUSTION CONTROL APPARATUS AND METHOD

James Adams, Highland Heights, and Felix Belin, Mayfield Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,706
Int. Cl.⁴ F23N *1/02*
U.S. Cl. 431—12 **19 Claims**



1. For a combustion process using multiple fuels having diverse combustion air requirements, a method for controlling the fuel-to-air ratio, comprising the steps of:

(a) generating a heating rate demand signal indicative of the amount of heating required;

(b) measuring the current fuel flow rate for each fuel being burned and generating a fuel heating rate signal indicative of the heating capacity of said fuels;

(c) generating individual fuel demand signals in a fuel heating rate demand development subsystem;

(d) adjusting the flow of individual fuels in response to their individual demand signal;

(e) generating an air requirement signal for measured fuel flows and their air requirements;

(f) generating a feedforward signal related to said air requirement signal;

(g) comparing said heating rate demand signal with said fuel heating rate signal and communicating the higher of said signals to a combustion air flow controller;

(h) adjusting said air controller in response to said communicated signal;

(i) measuring the actual air flow;

(j) generating an equivalent air heating rate signal which is a function of the measured air flow and said feedforward signal; and,

(k) comparing said equivalent air heating rate signal with said heating rate demand signal and communicating the lower of said signals to said fuel heating rate demand development subsystem.

12. Apparatus for controlling the combustion of multiple fuels having diverse excess air requirements, comprising:

(a) means for generating a heating rate demand signal;

(b) sensors for monitoring the flow rates of fuels being burned;

(c) scaling means for converting signals received from said sensors to signals representing the heating value per unit time of each of said fuels;

(d) first summing means for summing said signals to arrive at a gross fuel heating rate signal;

(e) other scaling means for converting said sensed signals to signals representing the theoretical air required per unit time for each of said fuels;

(f) other summing means for summing said signals;

(g) means for generating a feedforward signal as a function of the fuel mixture being burned and the heating values of said fuels;

(h) multiplying means for combining said feedforward signal with a signal representing the measured combustion air flow to produce an equivalent air heating rate signal;

(i) a low select comparator for comparing said heating rate signal with said equivalent air heating rate signal, said low select comparator operative to selectively communicate the lower of heating rate demand and equivalent to a fuel demand development subsystem;

(j) a high select comparator for generating an air demand signal for communication to a combustion air controller, said high select comparator operative to select the higher of said heating rate demand signal and said gross heating rate signal; and

(k) continuously recalibrated cross-limiting means for limiting the fuel flow rates to the available combustion air and for assuring sufficient combustion air for the measured fuel flows.

4,576,571
METHOD OF POLISHING THE SURFACE OF GLASS ARTICLES

Luc Moufflet, Vanves; Michel Roux, Marnes La Coquette, and Jean Valadier, Viry Chatillon, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

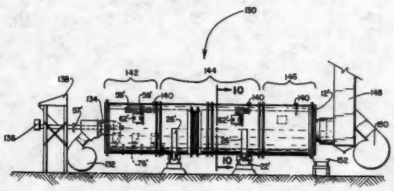
Filed Sep. 6, 1984, Ser. No. 648,252
Claims priority, application France, Sep. 6, 1983, 83 14181
Int. Cl.⁴ F27D *3/00*; F27B *14/00*; C03B *25/00*
U.S. Cl. 432—9 **5 Claims**

1. A method of polishing the surface of a glass article, comprising exposing said surface to a flame of oxygen and a fuel gas, said flame having a thermal energy originating from the transfer of heat by convection and a thermal energy originating from the transfer of heat by radiation, the fraction of the total energy transmitted by said flame to said surface by radiation being at most equal to 25% and the value of $H/Re^{0.5}$ being at least equal to 32 W/m^2K, h being the convection exchange coefficient and Re the Reynolds number, said flame containing OH^- ions and being an oxidizing flame.

4,576,572
APPARATUS AND METHOD FOR CLEANING CONTAMINATED SOIL

Edward E. Mueller, Tonka Bay, and Paul L. Jensen, Minneapolis, both of Minn., assignors to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 594,557, Mar. 29, 1984, Pat. No. 4,518,350. This application May 20, 1985, Ser. No. 736,429
Int. Cl.⁴ F27B *14/00, 7/36, 7/14, 9/14*
U.S. Cl. 432—13 **15 Claims**



14. A method for reclaiming soil contaminated with combustible liquid, comprising the steps of:

providing a generally horizontal refractory-lined drum having burners along the upper side adapted to heat the interior of the drum, and having predetermined internal indexing structure along the lower side of the drum adapted to mix and advance soil responsive to oscillation of the drum about its longitudinal axis;

supporting the drum for partial rotation about its longitudinal axis;

feeding contaminated soil through an inlet located in one end of said drum;

blowing additional combustion air through the drum inlet;

oscillating said drum over a predetermined arc centered on its longitudinal axis;

heating the interior of said drum with the burners sufficiently to incinerate any hydrocarbons in the soil and thereby effect thermal reclamation of the soil;

discharging the hot, reclaimed soil out of an outlet located in the other end of said drum; and

discharging the combustion products through an exhaust stack connected to the drum outlet.

4,576,573

HEATING A FIXED-BED CHARGE IN A TUBE REACTOR, AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

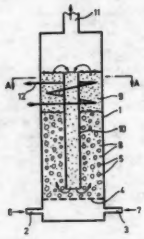
Wolfgang Ruehenbeck, Birkenau, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 565,219

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248502

Int. Cl.[4] F27B *15/00;* **C10G** *35/00*

U.S. Cl. 432—15 **6 Claims**



1. A method of heating a reactive fixed-bed charge having voids contained in a tube reactor which comprises: passing a fluidized heat transfer material through the voids in said reactive fixed bed charge whereby heat is added to or carried away from the fixed bed; passing said fluidized material from the voids in the fixed bed to a heat exchanger wherein the temperature of said fluidized material is regulated and, thereafter recycling the fluidized material through said voids in said fixed bed.

4,576,574

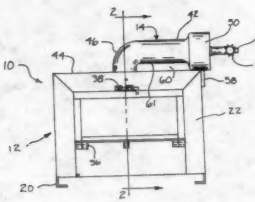
GAS HORSESHOE FORGE

Robert E. Schantz, 1226 Mead Dr., St. Louis, Mo. 63137

Filed Jan. 25, 1985, Ser. No. 694,785

Int. Cl.[4] F24J *3/00;* **F27D** *1/00;* **F23D** *14/62;* **F23M** *7/00*

U.S. Cl. 432—120 **11 Claims**



1. In a gas forge comprised of box-like housing having an insulated interior lining and an opening in a front wall for insertion of an article to be heated, the improvement comprising a wind-resistant low pressure burner having a burner outlet opening in a top wall of the housing, said burner having an imperforate tubular main body extending from a connection in said top wall rearwardly to a gas source of supply, said gas source of supply being connected to a restricted orifice supported in an enlarged annular rear primary air opening at a rear portion of the burner main body and said burner having a secondary air opening communicating with ambient air exteriorly of said housing, said burner outlet extending through an opening in said top wall of said housing and said secondary air opening comprising an annular opening between said top wall and said burner main body extending through said top wall to said outlet, said burner body being connected by a circumferential weldment means to a protective metallic shell enclosing said interior lining and said secondary opening being comprised of an opening means between said weldment means and said metallic shell and said burner body.

4,576,575

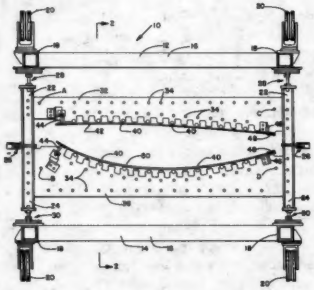
SLIP JOINT TOOLING FIXTURE FOR AIRFRAME STRUCTURE AND THE LIKE

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 3, 1985, Ser. No. 740,563

Int. Cl.[4] F27D *5/00, 1/00*

U.S. Cl. 432—253 **7 Claims**



1. A slip joint tooling fixture for providing unrestricted growth of material of a structure under construction and received in the fixture, the fixture and structure subjected to high temperatures, the fixture comprising:

an upper horizontal frame;

a plurality of upper bulk heads disposed vertically and in a spaced relationship to each other with the opposite ends of the bulk heads attached to bulk head supports;

a plurality of upper floating connectors attaching the upper bulk head supports to the upper frame;

a plurality of rollers attached to roller arms integrally formed along the length of the upper bulk heads for receiving the upper caul plate, one end of the caul plate attached on one side of the bulk heads, the other end of the caul plate slidably received in an expansion means attached on the other side of the bulk heads for allowing the caul plate to expand and contract therein;

a lower horizontal frame;

a plurality of lower bulk heads disposed vertically and in a spaced relationship to each other with the opposite ends of the bulk heads attached to lower bulk head supports;

a plurality of lower floating connectors attaching the lower bulk head supports to the lower frame;

a plurality of rollers attached to roller arms integrally formed along the length of the lower bulk heads for receiving a lower caul plate, one end of the caul plate attached on one side of the bulk heads, the other end slidably received in an expansion means attached on the other

side of the bulk heads for allowing the caul plate to expand and contract; and

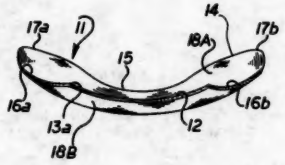
attachment means for securing together the upper and lower bulk head supports.

4,576,576

MEASUREMENT TEMPLATES FOR A DENTAL RESTORATION

Jacob E. Spanko, The Bigelow, 622, Pittsburgh, Pa. 15219

Filed Feb. 21, 1985, Ser. No. 703,757
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—72 8 Claims



1. An article of manufacture for planning the restoration of an irregular dentition involving determination of the actual curves defined by the cusps of the teeth of the natural dentition and being adapted for bilateral use on a dentition model comprising:

a. an essentially rigid, preformed template presenting a first and second surface with said first and lower surface being convex in relation to said second surface and being spaced apart therefrom but substantially conforming to the curvature of said second surface;

b. the mesial edge of the template being substantially linear and spaced apart in use from the lingual face of the anterior teeth;

c. the distal edge of the template being spaced apart from the mesial edge sufficiently to extend distally beyond the third molar;

d. the opposing lateral edges of the template being flanged outwardly from the mesial edge to the distal edge to parallel the diverging quadrants of the dentition model with both joining the distal edge in non-pointed corners; and

e. in which at least said first surface presents a preset substantially uniform curvature with the radius of said convex surface chosen to correspond to one of the variable radius curves limited by and to be established for the existing dentition under analysis, and further wherein the anterior to posterior curvature thereof corresponds to an ideal curve of Spee of a defined radius, and wherein the cross-denture arch curvature thereof corresponds to an ideal curve of Wilson of a defined radius.

4,576,577

BLENDED MODE CONCEPT FOR CONTROL OF FLIGHT SIMULATOR MOTION SYSTEMS

Wim J. Lam, Apalachin, N.Y.; Luitzen Devries, Amstelveen, Netherlands; Gordon M. McKinnon, Montreal, and Jean J. Baribeau, St. Laurent, both of Canada, assignors to CAE Electronics, Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 217,701, Dec. 18, 1980, abandoned. This application Apr. 25, 1983, Ser. No. 488,426
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—58 8 Claims

1. A motion simulator system comprising:

a platform unit;

means for imparting motion to said platform unit;

means for driving said means for imparting motion; and

circuit means for providing a command signal to said means for driving;

said circuit means comprising:

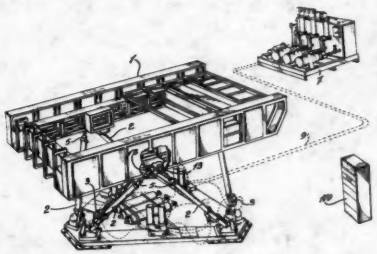
means for receiving an acceleration command signal;

means for receiving a position command signal; and

means for combining the acceleration and position command signals to provide a signal for driving said means for imparting motion; and

wherein said command signals comprise varying signals, and further comprising:

means for eliminating the effects of slowly varying acceleration command signals;



means for eliminating quickly varying position command signals; and

means for processing and combining the uneliminated acceleration command signals and position command signals; and

wherein:

the low cut-off frequency of said acceleration command signal is less than the high cut-off frequency of said position command signal; and

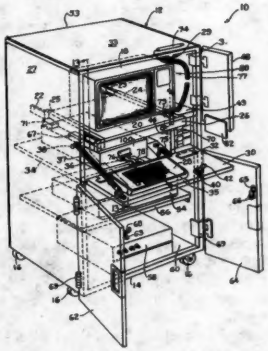
compensation means for removing distortions in the range between said high cut-off frequency and said low cut-off frequency.

4,576,578

INTERACTIVE TRAINING APPARATUS

Robert R. Parker, Wheeling, and Dominic J. DiGianfilippo, Mount Prospect, both of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Filed Mar. 31, 1983, Ser. No. 480,989
Int. Cl.[4] G09B *5/06*
U.S. Cl. 434—307 13 Claims



1. An improved interactive training apparatus including a video display device for displaying visual information, an audio device for providing audio information, a program control device for controlling the operation of the interactive

training apparatus, and a keyboard and a light pen input devices, said interactive training apparatus comprising:

a mobile enclosure for containing the interactive training apparatus;

means for movably carrying the video display device with respect to said enclosure to provide movement of a carried video display device outward from a first predetermined front plane of said enclosure;

operable means for inhibiting movement of said movable carrying means with respect to said enclosure;

means for inhibiting movement of said movable carrying means beyond a second, predetermined outwardly extended position;

means for movably mounting the keyboard input device between a first generally vertical position and a second generally horizontal position, such that the keyboard input device is accessible to an operator only in said second generally horizontal position; and

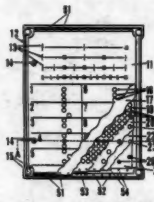
means for limiting access to the keyboard input device and for preventing movement of the keyboard input device from said first vertical position to said second horizontal position.

4,576,579

INSTRUCTIONAL AND TESTING APPARATUS WITH SWITCH CLOSURE AT TWO DIFFERENT DEPTHS

J. Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Jul. 23, 1984, Ser. No. 633,578
Int. Cl.[4] G09B *7/06*
U.S. Cl. 434—334 **4 Claims**



1. An instructional apparatus comprising:

an instructional sheet having zones thereon indicating at least two types of answer choices,

holding means provided with an upper surface for receiving said instructional sheet, and including a support member presenting said surface and having holes therein in alignment with corresponding zones on said instructional sheet,

an electrically conductive, elastic sheet element sandwiched between said instructional sheet and said upper surface and having a normal, planar disposition, said sheet element being capable of substantial deflection into an individual hole in said member when a stylus is applied to a selected zone on said instructional sheet,

electrical contact structure beneath said member and engageable by a deflected portion of said sheet element when said portion is pushed through a corresponding hole in said member by said stylus,

said structure having contact means disposed at two different depths relative to said surface corresponding to said two types of answer choices, said contact means including a second electrically conductive sheet element underlying said member and engageable by said deflected portion of the elastic sheet element upon deflection thereof to one of said two different depths,

said structure further having a third sheet element underlying said second element and provided with openings therein corresponding to the type of answer choice represented by the greater of said two different depths, and said contact means further including components thereof beneath said third sheet element at said greater depth in alignment with respective openings in said third sheet element for engagement by said conductive sheet element upon deflection of a part thereof by a stylus through a corresponding opening in said third element in response to the selection of an answer choice corresponding to the greater depth, and

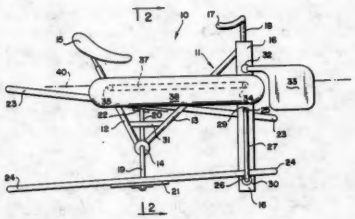
circuit means connected to said elastic sheet element and said contact means for communicating the types of responses of a student to electrical apparatus for feedback or information processing.

4,576,580

PEDAL POWERED WATERCRAFT

Arnold G. Gulko, 1835 Arcola Ave., Silver Spring, Md. 20902

Filed Aug. 10, 1984, Ser. No. 639,313
Int. Cl.[4] B63H *16/12*
U.S. Cl. 440—21 **12 Claims**



1. A pedal powered watercraft comprising a centrally disposed longitudinally extending frame carrying a centrally positioned pedal housing having one pedal movable from an uppermost to a lowermost position on each side of said frame, a pair of longitudinally extending laterally horizontal boards, one mounted on each of said pedals, said frame carrying a pair of vertically spaced apart stops positioned outwardly of said frame on each side of the watercraft at the forward end thereof, said boards extending forwardly of said pedals beyond said stops with said stops being positioned so that the upper stops are below the upper surface of said boards when the pedal carrying the same is at the upper limit of its path of movement, and the lower stops are above the lower surface of said boards when the pedal carrying the same is at the lower limit of its path of movement.

4,576,581

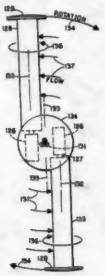
REVERSIBLE MAGNUS PROPELLER

John L. Borg, 8200 Toro Creek Rd., Atascadero, Calif. 93422

Continuation-in-part of Ser. No. 325,741, Nov. 30, 1981, abandoned. This application Mar. 30, 1984, Ser. No. 595,306
Int. Cl.[4] B63H *23/16*
U.S. Cl. 440—86 **11 Claims**

5. The method of reversing the thrust of a Magnus propeller having a hub rotatable in either direction about an axis and a Magnus cylinder connected to the hub and continuously rotat-

able in either direction about an axis that is generally radial to the hub axis comprising:



(a) driving continuously through multiple 360° rotations the hub and the cylinder with independent reversible power means;

(b) and reversing one of said power means.

4,576,582

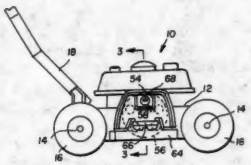
TOY BUBBLE-BLOWING LAWN MOWER

James S. Panzarella, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 25, 1985, Ser. No. 695,177

Int. Cl.[4] A63H *33/28*

U.S. Cl. 446—16 **5 Claims**



1. A toy bubble-blowing lawn mower comprising in combination:

a lawn mower body;

wheels rotatably mounted on said body to support said body for back and forth movement;

a propeller mounted for rotation on said body;

a housing on said body enclosing said propeller, said housing having a first opening through which a continuous stream of air is directed upon rotation of said propeller;

a reservoir formed in said body below the stream of air for receiving a bubble-forming liquid;

a bubble disk mounted on said body for rotation in a first plane normal to the stream of air with a portion of said disk immersed in the bubble-forming liquid in said reservoir, said disk having a plurality of radially and equi-angularly spaced apertures adapted to pass through the liquid in succession upon rotation of said bubble disk to form liquid films across said apertures;

an impeller mounted for rotation on said body, said impeller having a cam;

means coupling said impeller to said propeller for unidirectionally rotating said propeller during rotation of said impeller in either direction;

means coupling at least one of said wheels to said impeller for rotating said impeller upon rotational movement of said wheel; and

means intermittently coupling said impeller cam to said bubble disk for advancing said bubble disk upon rotation of said impeller to successively position film covered apertures into alignment with the stream of air which blows the liquid films into bubbles.

4,576,583

TOY CAPABLE OF EXECUTING MULTIPLE MOVING MODES

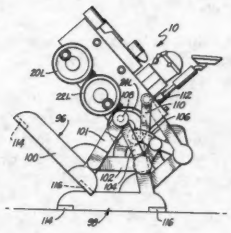
Yosuke Yoneda, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 654,167

Claims priority, application Japan, Sep. 29, 1983, 58-150771

Int. Cl.[4] A63H *17/00*

U.S. Cl. 446—94 **11 Claims**



1. A moving toy which comprises:

a unitary body;

motor means mounted on said body;

at least two rotating elements permanently rotatively mounted on said body, each of said rotating elements operatively connected to said motor means so as to be rotated on said body by said motor means;

at least two sets of moving members, each of said sets of moving members independently temporarily connectable to said rotating elements, and when said moving members are connected to said rotating elements said moving member supporting said toy on a support surface, each of said sets of moving members differing from the other of said sets of moving members whereby one of said sets of moving members moves said toy on said support surface in a rolling manner and a further of said sets of moving members moves said toy on said support surface in a walking manner.

4,576,584

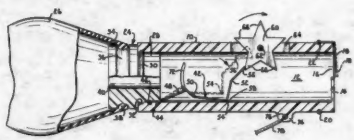
WILD TURKEY CALL

T. Don Hill, Platte County, Mo., assignor to Ferguson Manufacturing, Inc., Richmond, Mo.

Filed Dec. 27, 1983, Ser. No. 565,584

Int. Cl.[4] A63H *5/00*; G10K *5/00, 9/00*

U.S. Cl. 446—193 **15 Claims**



1. A device for attracting game birds such as wild turkeys, said device comprising:

a hollow body presenting a cavity therein and having opposite ends, said body having an opening permitting sound to be transmitted out of said cavity;

a diaphragm on one end of said body, said one end of the body forming a mouthpiece to effect vibration of said diaphragm and said diaphragm having one side exposed to

said cavity and being vibratile in response to blowing on the mouthpiece to produce sound in said cavity;

an air bulb on the other end of said body, said bulb being compressible to pressurize said cavity to vary the sound produced therein by said diaphragm in a manner to simulate a gobbling sound of game birds;

an anvil surface in said cavity, said anvil surface being a rigid surface which is rigid with said body;

a spring element in said cavity having one end fixed to said body and an opposite free end, said spring element having a pair of arm portions which intersect between said ends to present at the point of intersection a sharp corner forming a hammer for generating a clucking sound simulating a clucking sound of game birds upon successively striking said anvil surface, said arm portions being oriented and arranged to remain out of contact with said anvil surface to avoid interfering with the sound generated by said hammer; and

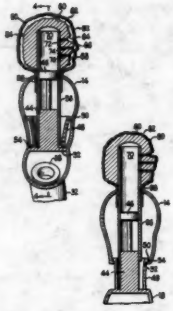
activating means for said hammer having a plurality of projecting fingers acting in succession on said free end of the spring element in a manner to displace the hammer from the anvil surface and to then release said free end to permit said spring element to successively strike the hammer against the anvil surface, thereby generating said clucking sound to attract game birds.

4,576,585

TOY FIGURES WITH VACUUM CHANGEABLE FEATURES

John M. Balogh, and Rouben T. Terzian, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 24, 1985, Ser. No. 694,616
Int. Cl.[4] A63H *13/00, 3/20*
U.S. Cl. 446—199 **16 Claims**



1. A toy having a body portion comprising:

a head having a substantially rigid outer surface of a first appearance;

a relatively flexible outer mask that is self-supporting in normal atmospheric pressure with a second appearance;

the head being hollow with an interior and conduits extending from the interior through to the substantially rigid outer surface;

substantially airtight attachment of the mask to the toy, covering, but spaced from, the substantially rigid outer surface;

air at generally normal atmospheric pressure in the space between the substantially rigid outer surface and the flexible mask; and

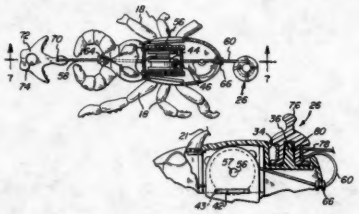
means for reducing the pressure in the space between the substantially rigid outer surface and the flexible mask to collapse the flexible mask and change the second appearance of the flexible mask to conform to the first appearance of the substantially rigid outer surface.

4,576,586

CORD-CLIMBING CREATURE

Francis R. Amici, Northford; Hans S. Berger, Plainville; Richard I. Farrington, New Britain, and Pietro Piazza, Prospect, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 20, 1985, Ser. No. 703,333
Int. Cl.[4] A63H *11/04*
U.S. Cl. 446—315 **14 Claims**



1. A cord-climbing simulated creature comprising:

A. a creature figure having a head, a body and legs, said creature body being comprised of a bottom section and a top section secured together along transversely disposed abutting surfaces and defining a body cavity therebetween, said sections providing apertures along each side thereof, a pair of leg forming elements including a web portion in said body cavity extending along a side of said body and flexible leg portions extending outwardly of said apertures from said web portion, said top section also providing an upstanding post on its outer surface adjacent its rearward end;

B. a winch assembly seated in said body and including a housing and a winch with a shaft supported for rotation within said housing, said winch having a first winch portion adjacent one axial end thereof and a second winch portion adjacent the other axial end thereof having a diameter greater than that of said first winch portion;

C. an elongated, flexible string-like member having a first portion extending about said first winch portion of said winch and outwardly of an aperture in the front of said winch assembly housing and thence through an aperture in the head of said creature figure, said string-like member having a second portion extending about said second winch portion of said winch and thence outwardly through an aperture in the rear of said winch housing and thence through the rear portion of said creature figure;

D. a hook element secured to the outer end of said first portion of said string-like member, said hook element being configured to permit suspension of said creature thereby; and

E. a spool secured to the outer end of said second portion of said string-like member and adapted to coil the string-like member thereabout, said spool having a recess therein seating said post therein.

4,576,587

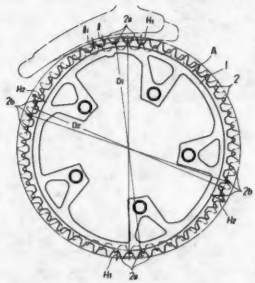
FRONT CHAIN GEAR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 14, 1984, Ser. No. 579,970
Claims priority, application Japan, Feb. 19, 1983, 58-26783
Int. Cl.[4] F16H *55/30*
U.S. Cl. 474—152 **3 Claims**

1. A front chain gear for a bicycle, comprising a combination of at least one larger diameter chain gear with at least one smaller diameter chain gear, both said chain gears being different in tooth number from each other, at least said larger diameter chain gear being non-round in shape to provide a largest pitch diameter portion and a smallest pitch diameter portion,

teeth at said largest pitch diameter portion being smaller in height than teeth at said smallest pitch diameter portion,



whereby an addendum circle of said chain gear is of nearly exact circularity.

4,576,588

ADJUSTABLE TUBE FORMING APPARATUS

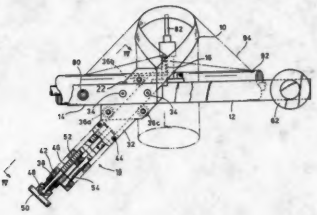
Yoshiaki Umeda; Ryouhei Matsumoto; Hiroyasu Isomura, and Hisakuni Shimotaka, all of Nagoya, Japan, assignors to Fuji Machinery Company, Ltd., Nagoya, Japan

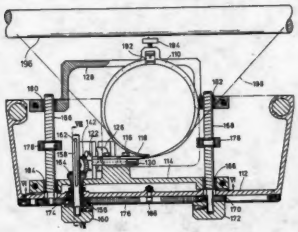
Filed Oct. 3, 1984, Ser. No. 657,250

Claims priority, application Japan, Nov. 30, 1983, 58-227679; Apr. 16, 1984, 59-77012

Int. Cl.[4] B31B *1/40, 27/26;* **B65B** *9/06*

U.S. Cl. 493—475 **4 Claims**





1. An apparatus for forming a web or wrapping material comprising:

a rectangular frame with an open center;

a first and a second transversely spaced apart support members mounted within said frame;

a highly flexible, elongated elastic sheet material fixedly connected at one end to said first support member, said sheet material extending obliquely upwardly from said fixed one end toward said second support member and then returning to form a loop, the returning other end of said sheet material intersecting in front of said fixed one end and extending obliquely downwardly; and

means for freely contracting and expanding said loop formed by said sheet material, by advancing and retracting said sheet material, comprising actuating means fixedly mounted to and disposed generally below said first support member and connected to said downwardly extending other end of said sheet material.

4. In an apparatus for forming a web of wrapping material including a frame, a support member mounted within the frame, and a highly flexible, elongated elastic sheet material fixedly connected at one end to the support member, the sheet material extending obliquely upwardly from the fixed one end and then returning to form a loop, the returning other end of the sheet material intersecting in front of the fixed one end and extending obliquely downwardly, actuating means for advancing and retracting said elastic sheet material comprising:

a pair of support plates secured at right angles to said support member;

a pair of rollers disposed between and rotatably carried by said support plates through rotary shafts, said rollers being operatively connected relative to each other for rotation in opposite directions and adapted to pressingly hold the downwardly extending other end of said sheet material;

a first bevel gear secured to one end of one of said rotary shafts;

a second bevel gear secured to said support member at right angles relative to said first bevel gear and meshed with said first bevel gear; and

a shaft with a knob splined to said second bevel gear, whereby rotation of said shaft in either direction causes said sheet material held between said rollers to be advanced and retracted, thereby freely contacting and expanding the loop formed by said sheet material.

4,576,589

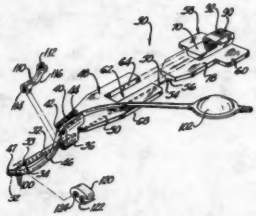
TROCAR

Robert G. Kraus, Attleboro; Enora S. Kunica, Wellesley, and Joseph J. Praderio, Quincy, all of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Mar. 28, 1983, Ser. No. 479,303

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—8 **11 Claims**



1. A trocar comprising:

a cannula having a lumen extending axially throughout its length and having a distal end and a proximal end;

a generally U-shaped flange affixed to the proximal end of said cannula and aligned generally parallel to and radially offset from the longitudinal axis of said cannula;

said U-shaped flange including a first mating surface, and the confronting surfaces of the interior of said U-shaped flange forming a portion of a V-bed;

a rod having a closed distal end and a proximal end and adapted for slidable insertion into said cannula lumen, said rod having a length greater than said cannula;

a generally planar flange attached to the proximal end of said rod;

said rod flange including a second mating surface adapted to mate with said first mating surface and including a projec-

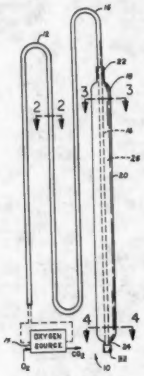
tion extending from said second mating surface having surfaces forming a second portion of said V-bed and cooperating with said first portion of said V-bed to form an interfitting V-bed for restraining relative rotation between said rod and said cannula and for restraining said rod from receding into said cannula as said trocar is advanced through body tissue during insertion.

4,576,590

INTRALUMINAL MEMBRANE OXYGENATOR METHOD FOR A TUBULAR ORGAN OF THE GASTROINTESTINAL TRACT

Richard G. Fiddian-Green, 311 Awixa, Ann Arbor, Mich. 48104

Filed Dec. 29, 1983, Ser. No. 566,649
Int. Cl.[4] A61M *25/00, 37/00*
U.S. Cl. 604—26 **6 Claims**



1. A method for intraluminal membrane oxygenation of a tubular internal organ of the gastrointestinal tract independently of the vascular blood supply to the organ which comprises introducing a catheter having a closed cylindrical walled chamber on a tube into the organ so as to dispose the wall of the chamber in contact with and against the lumen of the organ, said tube having an entrance to and an exit from said chamber which are disposed axially spaced apart along the length of the catheter, the wall of said chamber comprising a material which is freely permeable to gas but poorly permeable to liquid, perfusing the interior of the chamber via said tube with oxygen to create a pressure gradient between the chamber and the lumen of the organ so as to cause oxygen to diffuse through the wall of the chamber to the lumen of the organ by introducing oxygen into the tube at an external inlet, conducting the oxygen through the tube and into the chamber, thence axially through the chamber along the wall thereof, and thence from the chamber through the tube to an external outlet, and continuing the perfusion step for a sufficient time to conduct the oxygenation procedure.

4,576,591

MEDICAMENT IMPLANT APPLICATOR

Gordon E. Kaye, Garrison, N.Y.; Eugene B. Schwartz, Altamonte Springs, Fla., and Irving V. Sollins, Jiutepec Morelos, Mexico, assignors to Ivy-Gene Co., Inc., Overland Park, Kans.

Continuation-in-part of Ser. No. 511,251, Jul. 6, 1983, Pat. No. 4,531,938. This application Apr. 6, 1984, Ser. No. 597,376
Int. Cl.[4] A61M *31/00, 5/00;* **F42B** *37/00;* **B65D** *85/24*
U.S. Cl. 604—62 **3 Claims**

1. A pistol-like medicament implanter comprising:

(a) a hollow needle and a plunger in axial alignment, said plunger being movable into said hollow needle;

(b) storage means for at least one medicament implant dosage unit interposed between needle and plunger, such dosage unit being disposed in a passthrough chamber indexed in line with needle and plunger whereby said plunger may travel through the indexed dosage unit chamber to expel the medicament therefrom; and

(c) a trigger means and a plunger means operatively connected so that when said trigger means is pulled, said plunger advances through said chamber into the bore of said needle expelling thereby the implant dosage unit therefrom, and thereafter retracts when said trigger means is released;

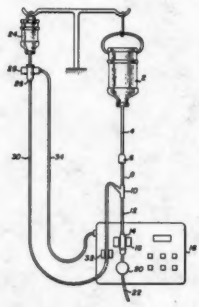
(d) the connection between trigger means and plunger means being an endless belt mounted between and interengaged with a drive gear driven by said trigger means and an idler sprocket, the plunger being disposed above said endless belt, riding thereon and being secured thereto, whereby said plunger is advanced and retracted through the movement of said endless belt around the drive gear upon pulling and retracting of said trigger means.

4,576,592

DUAL SOURCE PARENTERAL INFUSION APPARATUS

Hal C. Danby, Palo Alto, Calif., assignor to Anatros Corporation, San Jose, Calif.

Filed Mar. 30, 1983, Ser. No. 480,527
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—80 **8 Claims**

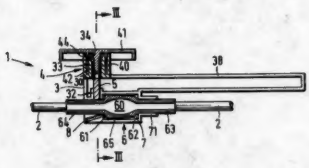


1. A parenteral infusion apparatus for delivering parenteral solutions from two sources comprising a first drip chamber with a primary flow sensor means associated therewith for detecting liquid flow rate through the primary drip chamber, a supplemental solution drip chamber with supplemental solution flow sensor means associated therewith for detecting liquid flow rate through the supplemental solution drip chamber, the outlet of the supplemental solution drip chamber being connected with the primary drip chamber inlet by conduit means having a shut-off control system means associated therewith for terminating supplemental solution flow through the conduit when the measured flow detected in the supplemental solution drip chamber is less than the flow detected in the primary drip chamber.

4,576,593
DOSING DEVICE FOR INFUSION OR TRANSFUSION OF FLUIDS

Heinrich Mommer, Stolberg, Fed. Rep. of Germany, assignor to M. Faensen and Iphas Pharma-Verpackung, both of, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 577,967
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304831
Int. Cl.[4] A01F *2/80*
U.S. Cl. 604—250 11 Claims

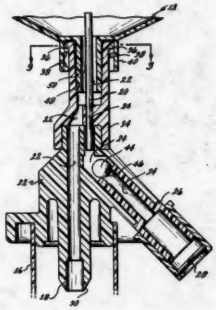


1. A dosing device used in the infusion or transfusion of fluids connected in a flexible fluid line said device comprising a housing, a tubular element comprising an elastomeric material having leading and trailing sections which traverses said housing to interconnect respective ends of said fluid line, said tubular element comprising a thicker portion between said leading and trailing sections thereof, which thicker portion protects against longitudinal displacement of said housing, and a pressing element supported in said housing for compressing said tubular element, said pressing element engaging said tubular element at said leading section of said tubular element outside the region of said thicker portion.

4,576,594
VENTED DRIP CHAMBER FOR USE WITH A SYRINGE

John S. Greenland, Encinitas, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 26, 1984, Ser. No. 634,838
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—251 15 Claims



1. A vented drip chamber for engaging with a syringe comprising:

a container;

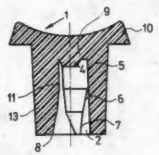
an adapter mounted on said container for engaging said drip chamber to said syringe, said adapter having a drop former disposed in said container and having a fluid passageway therethrough for fluid communication between said syringe and said drop former; and

a cannula with a first end and a second end and having said first end attached to said adapter with said second end coaxially aligned within a portion of said fluid passageway and extending therefrom for insertion into said syringe for defining an air passageway to vent air from outside said drip chamber into said syringe.

4,576,595
METHOD AND A CLOSURE CAP FOR SEALING A CAPILLARY TUBE

Flemming Aas, Soborg, and Borge Jeppesen, Glostrup, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Continuation of Ser. No. 316,141, Oct. 29, 1981, abandoned. This application Dec. 24, 1984, Ser. No. 685,962
Claims priority, application Denmark, Oct. 31, 1980, 4618/80
Int. Cl.[4] A61B *10/00*; A61J *1/00*
U.S. Cl. 604—256 15 Claims



1. A closure cap for anaerobicly sealing an open end of a capillary tube having an inner and outer surface and being filled with a blood sample, said cap comprising an end wall having an inner surface and an annular skirt portion extending axially therefrom, the inner surface of said end wall comprising means for sealingly engaging with said open tube end the annular skirt having an inner surface of the skirt exceeding the cross section of the outer surface of the capillary tube thereby defining an annular space between the inner surface of the skirt portion and the outer surface of the capillary tube in the mounted position of the cap, said closure cap further comprising a skirt compression member having a passage defined therein for receiving said cap when mounted on said capillary tube, the cross section of said passage being sized so as to compress said skirt portion radially inwardly into frictional contact with the outer peripheral surface of the capillary tube when said cap skirt portion is inserted into said passage, whereby said end wall may be maintained in sealing engagement with said open tube end.

4,576,596
RESILIENT SHAPE-RETAINING SANITARY NAPKIN

David M. Jackson, Gwinnett County, Ga.; Billie J. Matthews, Winnebago County, and S. Richard Bornslaeger, Outagamie County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 3, 1983, Ser. No. 471,582
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 6 Claims

1. A sanitary napkin comprising:

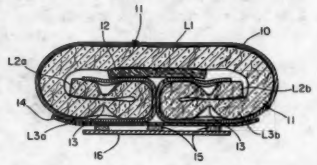
a generally planar absorbent batt containing a fusible thermoplastic component, said batt being folded upon itself a first time along a first pair of generally parallel longitudinally extending fold lines to form a first and a second layer for said napkin, and folded upon itself a second time along a second pair of generally parallel longitudinally extending fold lines to form a third layer for said napkin,

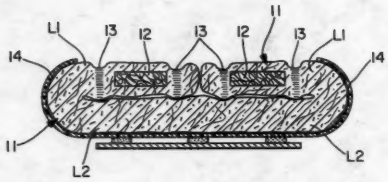
said first and second layers being fixed together adjacent each of said first pair of fold lines by fusing said first and second layers along longitudinally extending fuse lines.

6. A sanitary napkin comprising:

a generally planar absorbent batt containing a fusible thermoplastic component, said batt having a pair of longitudinal side edges and being folded upon itself along a pair of generally parallel longitudinally extending fold lines to

form a first and a second layer for said napkin with said side edges generally meeting in the middle of said napkin, two inserts of material having a higher absorbency than said batt carried within said batt, each insert being located adjacent and extending along a respective side edge of said





batt such that said inserts are generally centered on said folded batt on either side of a midline to said napkin, and a pair of longitudinally extending fuse lines associated with each insert, with a respective insert located between its pair of fuse lines.

4,576,597

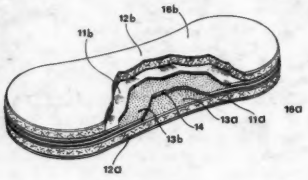
SANITARY NAPKIN SET

James J. Hlaban, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 30, 1983, Ser. No. 537,922

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—390 **5 Claims**



4. A method for making sets of sanitary napkins comprising:

providing first and second webs each comprised of a layer of fluid absorbent material having two faces and a layer of fluid impermeable baffle material affixed to one face of said layer of absorbent material, and a third web of a release liner material having two faces,

coating both faces of said release liner web with an adhesive pattern,

combining said first web with said release liner by placing the adhesive pattern on one face of said release liner web against said baffle material of said first web,

combining said second web with said release liner web by placing said baffle material of said second web against the adhesive pattern on the other face of said release liner web,

applying pressure to removably attach said combined first and second webs to said release paper, and

die-cutting said attached first, second and third webs to form sets of sanitary napkin pairs sharing a common release liner.

4,576,598

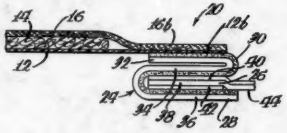
DISPOSABLE DIAPER WITH IMPROVED ADHESIVE TAB SYSTEM

Ludwig Tritsch, Wilmette, Ill., assignor to Personal Products Company, Milltown, N.J.

Filed Oct. 27, 1983, Ser. No. 545,986

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—390 **6 Claims**



1. In combination with a disposable diaper having an absorbent layer and a moisture-impervious backing sheet, an improved adhesive tab system for fastening said diaper about an infant, comprising: an adhesive tab having a tacky adhesive surface extending substantially the entire length thereof in facing relationship to said backing sheet; said adhesive tab having an anchoring end portion, an intermediate portion and a free end portion; said anchoring end portion of said tab being permanently secured to an outside surface of said backing sheet at a marginal location thereof; a release liner having release surfaces on both sides thereof; one of said release liner surfaces having a portion thereof which is permanently secured to an outermost portion of said free end portion of said tab such that the remaining portions of the release surface on said one side of said release liner is releasably attached to and covers the tacky surface of said free end portion of said tab; said intermediate portion of said tab being folded back under said backing sheet with the tacky surface thereof facing outward of said backing sheet in preparation for use of said adhesive tab; and said free end portion of said tab and the release liner affixed thereto being further folded back such that the release surface on the other side of said release liner is releasably attached to and covers the tacky surface of said intermediate portion of said tab.

4,576,599

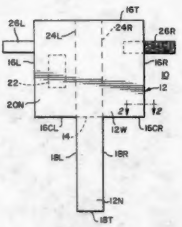
SANITARY PADS FOR MEN

Harry Lipner, Tallahassee, Fla., assignor to Florida State University, Tallahassee, Fla.

Filed May 14, 1984, Ser. No. 609,651

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—390 **12 Claims**



4. A sanitary pad for men comprising: a layered body portion including a relatively thick layer of absorbent material disposed on a first face of said body portion and having an internal surface opposite to said first face, a fluid-barrier layer

parallel and attached to said internal surface, and a relatively thin layer of absorbent material disposed on a second face of said body portion opposite said first face and attached to said fluid barrier layer, and first adhesive means mounted to said body portion; and wherein said body portion is completely bounded by a plurality of edges, said body portion ending at said plurality of edges, and wherein said sanitary pad is adapted for disposal in:

I. a storage mode with said body portion non-overlapping, flat in a plane, and said plurality of edges all in said plane; and

II. an enveloping mode with said body portion folded to be non-planar and at least partially envelope a wearer's penis and said adhesive means operable to maintain said body portion in proper position, and

wherein, in said enveloping mode, said body portion is folded to include an inner arm adapted for disposal at least partially between the wearer's penis and skin and an outer arm adapted for disposal between the wearer's penis and his clothes and each arm extending lengthwise along the wearer's penis and wherein, in said storage mode, said body portion includes a relatively wide portion and a relatively narrow portion, said relatively wide portion having right and left wings; and, in said enveloping mode, said narrow portion is folded to form a narrow generally semi-cylindrical portion constituting one of said inner and outer arms, and said wide portion is folded to form a wide generally semi-cylindrical portion constituting the other of said inner and outer arms and disposed at least partly around said narrow generally semi-cylindrical portion, and said wide portion is separated from said narrow portion by a fold disposed at an end of the pad nearest the tip of the wearer's penis.

4,576,600

FASTENERS FOR DIAPERS

Curt G. Joa, Ocean Ridge, Fla., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Mar. 18, 1985, Ser. No. 713,336
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—390 **10 Claims**

1. A fastener for a disposable diaper, the diaper comprising a fluid permeable inside sheet for interfacing with the body, a moisture-impermeable outer backing sheet substantially coextensive with the inner sheet and bonded about its margins to said inner sheet, and absorbent material interposed between said inner and outer sheets, said fastener comprising:

a strip of tape having an inner surface and an outer surface, said inner surface having a first zone constituting a release zone that has a low affinity for an adhesive and a second zone that has a high affinity for said adhesive adjacent said first zone,

a coat of adhesive on said inner surface of said strip over said first release zone and over said second zone, the part of said strip containing said second zone being adhered tenaciously to said impermeable outer backing sheet of the diaper at the margin of the diaper and the part of said strip containing said first release zone being folded around the edge of said diaper to place the adhesive coated release zone of the inner surface of said strip in contact with the margin of said inside fluid permeable sheet of the diaper to conceal the adhesive for facilitating storage of the diaper,

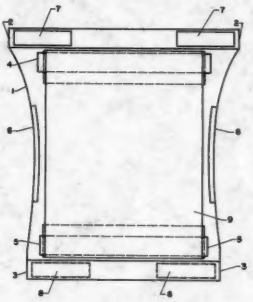
peeling the part of said fastener strip having the release zone from said inside sheet causing said adhesive to transfer from said release zone of the fastener strip to the margin of said inside sheet so the resulting adhesive coated area on said inside sheet may be pressed onto said outer sheet remotely from said area to secure the diaper on a body.

4,576,601

DIAPER MAGIC, OPEN PLASTIC PANTS TO HOLD CLOTH DIAPERS OR DISPOSABLE LINER

Lucille M. Brain, Rte. 1 Box 309 C, Hawthorne, Fla. 32640

Continuation of Ser. No. 304,319, Sep. 21, 1981, abandoned. This application Sep. 4, 1984, Ser. No. 646,489
Int. Cl.[4] A41B *9/04*
U.S. Cl. 604—398 **9 Claims**



1. A diaper holder comprising a plastic piece extending between an inextensible back waistband portion and an inextensible front waistband portion along two sides, each waistband portion having two ends, each side having an elastic member to provide elastic contractable leg portions by gathering at least part of the side, front and back inextensible bands attached to said plastic piece to extend lengthwise along and adjacent to said respective front and back waistband portions and operable to hold a cloth diaper or disposable pad placed over and under the bands, each of said waistband portions having a releasable hook/pile fabric fastening portion at least at each of its ends, and wherein said diaper holder forms pants upon each of said fastening portions of said front waistband portion being secured to a complimentary one of said fastening portions of said back waistband portion with each contractable leg portion defining a leg opening, each side having an overlapping portion disposed to overlap a corresponding overlapped portion of the same side, each overlapping portion movable relative to the corresponding overlapped portion from the leg opening up to the waistband portions such that air may circulate under the overlapping portions, and wherein said fabric fastening portions on said waistbands are fastenable so as to adjust the diaper holder for different sized waists.

4,576,602

BLOW MOLDED CONTAINER WITH INTEGRAL ADMINISTRATION PORT

Harold A. Levin, Grayslake, and Mark E. Larkin, Lindenhurst, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 8, 1984, Ser. No. 578,161
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—408 **10 Claims**

1. A flexible, collapsible container for medical fluids composed of a flexible, inert, plastic material, said container comprising:

a body section of generally tubular configuration, said body section defining front, back, side and opposing end wall portions;

said end wall portions defining a hanger section at one end and a tubular portion with a diaphragm extending from the opposing end, said tubular portion being formed with

a stepped parting line and said diaphragm being formed without a stepped parting line and having its thinnest dimension at the center thereof;

said body section being blow molded from a plastic resinous material with said tubular portion and said diaphragm being formed in a one-piece construction with said container, said diaphragm being positioned adjacent the outward end of said tubular portion, said tubular portion and said diaphragm being constructed and arranged to receive a piercing pin with portions of said pierced diaphragm in a fluid-tight manner;

whereby a fluid-tight connection can be effected between a flexible, collapsible container for medical fluids and an I.V. administration set.

4,576,603

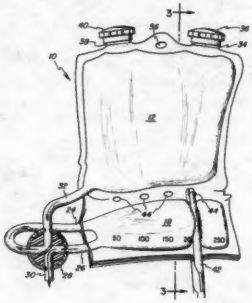
FEEDING DEVICE FOR ENTERALLY ADMINISTERING LIQUIDS INTO A HUMAN BODY

Gerald Moss, R.D. #1, West Sand Lake, N.Y. 12196

Filed Jun. 18, 1984, Ser. No. 621,675

Int. Cl.[4] A61J 7/00

U.S. Cl. 604—410 **4 Claims**



1. A device for the enteral introduction of liquids into a human body comprising:

a reservoir;

an inextensible, collapsible feeding container communicating with said reservoir, said feeding container being variable in volume between an expanded state containing a predetermined maximum volume and a contracted state wherein said container is substantially empty;

an inextensible divider separating the feeding container into two substantially equal chambers, said divider being sufficiently flaccid to conform to the opposite wall of either chamber such that the maximum volume of either chamber is substantially equal to the maximum volume of the container in its expanded state, each chamber having a passageway for the introduction and expulsion of liquids; and

a flow alternating means connected between the reservoir and the chambers for selectively directing the liquid flow from the reservoir to one of the chambers while simultaneously directing the flow from the other chamber to the patient.

4,576,604

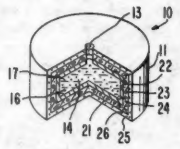
OSMOTIC SYSTEM WITH INSTANT DRUG AVAILABILITY

George V. Guittard, Cupertino; Joseph C. Deters, Mountain View; Felix Theeuwes, Los Altos, and Richard Cortese, San Jose, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 4, 1983, Ser. No. 472,333

Int. Cl.[4] A61K 9/22, 9/00

U.S. Cl. 604—890 **34 Claims**



1. An osmotic device for delivering a beneficial agent to an environment of use, the osmotic device comprising:

(a) a wall at least in part formed of a substantially inert material which surrounds and forms a compartment containing a beneficial agent formulation, said substantially inert material being permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of the beneficial agent in the compartment;

(b) a beneficial agent in the wall, said agent being released from the wall when the osmotic device is in operation in a fluid environment of use; and,

(c) an osmotic passageway in the wall communicating with the compartment and the exterior of the device for dispensing the beneficial agent from the compartment when the device is in the environment of use wherein fluid passes through the wall, causes the formation of an osmotic pressure gradient across the wall and dispenses the beneficial agent from the compartment to the environment via the osmotic passageway.

4,576,605

CARDIAC VALVE PROSTHESIS

Arnold N. Kaidash; Naum A. Iofis; Semen G. Khurtsilava; Alexandr S. Bukatov, and Zinaida P. Danilova, all of Moscow, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Khirurgii Imeni A.V. Vishnevskogo, Moscow, U.S.S.R.

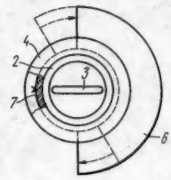
Filed Mar. 1, 1985, Ser. No. 707,145

Int. Cl.[4] A61F 2/24

U.S. Cl. 623—2 **3 Claims**

1. In a cardiac valve prosthesis including an annular body having a valving member and an annular suturing collar disposed outside the annular body, the improvement comprising an annular suturing collar having an outer periphery and a groove extending along the entire outer periphery thereof, and

a disc segment made of an elastic material, said disc segment mounted in said groove for angular displacement therewithin



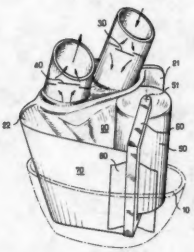
relative to the axis of the suturing collar to permit positioning of said disc segment in a desired angular position.

4,576,606

IMPLANTABLE BLOOD PUMP

Vincent Pol, Marseille, and Jean-Claude Dumas, Auriol, both of France, assignors to Clinique de la Residence du Parc, Marseille, France

Filed Dec. 19, 1984, Ser. No. 684,348
Claims priority, application France, Dec. 28, 1983, 83 20933
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 **10 Claims**



1. A blood pump, comprising:

an outer shell;

at least one closed elastically deformable pocket which is fed with blood fluid via an inlet valve and which is capable of ejecting said fluid via an outlet valve;

said pocket being substantially flat when unstressed and being placed against the inside wall of the shell in such a manner as to present two walls, which, following the curve of the shell both have their concave sides directed towards the interior of the shell, these two walls extending between two longitudinal elongate regions forming proximal and distal ends;

a drum, with the proximal end of the pocket connected to the periphery thereof;

a bracket rotatably mounted on the longitudinal axis of the drum;

means for providing a traction link between the bracket and the distal end of the pocket; and

means for driving the bracket and the drum in mutual antagonistic rotation over a fraction of a turn in a direction enabling the drum to come into rolling contact with the wall of the pocket while the bracket maintains the distal end and tends to bring it closer to the drum;

in such a manner as to enable the pocket to be compressed under the effect of its being wound around the drum; and

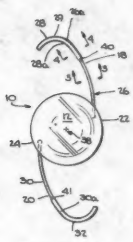
in such a manner that the successive positions of the drum-bracket assembly follow a movement of least resistance between the compression reaction of the pocket and the traction reaction of the distal end of the pocket.

4,576,607

INTRAOCULAR LENSES

Charles D. Kelman, North Shore Towers - 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,695
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **10 Claims**



1. An intraocular lens suitable for use as an artifical lens implant, the lens comprising:

a medial, light-focusing, lens body intended to be positioned adjacent to the pupil in the anterior or posterior chamber of the eye, and a pair of position fixation members connected with said lens body;

one of the said position fixation members adapted to extend to and seat in the vascular tissue of a first groove portion of the eye adjacent ot the periphery of the iris;

the other of said position fixation members adapted to extend to and seat in the vascular tissue of a second groove portion of the eye adjacent to the periphery of the iris;

at least said one position fixation member comprising a resilient leg portion connected at one end with said lens body and a seating portion extending from the other end of said leg portion, said seating portion comprising a first material which is substantially biologically inert to the environment within the eye and exhibits a given springiness and said leg portion comprising a second material which is substantially less biologically inert to the environment within the eye than said first material and exhibits a substantially greater springiness than said first material.

4,576,608

POROUS BODY-IMPLANTABLE POLYTETRAFLUOROETHYLENE

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation-in-part of Ser. No. 204,528, Nov. 6, 1980, abandoned. This application Nov. 8, 1983, Ser. No. 549,805
Int. Cl.[4] A61F 2/02, 2/08, 2/30
U.S. Cl. 623—11 **7 Claims**

1. A composite in vivo implantation material comprising:

a porous, compacted, sintered blend of biocompatible resin fibers and a biocompatible resin binder, said resin fibers consisting entirely of polytetrafluoroethylene fibers and said resin binder consisting entirely of particles of polytetrafluoroethylene resin, said resin fibers and said resin binder being fused together to form a continuous porous matrix with said resin binder retaining said resin fibers therein, said material having a porosity between around fifty (50) percent to ninety (90) percent by volume, the majority of the pores in said porous sintered blend having a size in the range between eighty (80) and four hundred (400) microns.

5. A laminated material suitable for in vivo implantation and having at least two layers, one of said layers comprising:

a porous compacted, sintered blend of a biocompatible fiber component and a biocompatible binder component, said fiber component consisting entirely of polytetrafluoroethylene fibers and said binder component consisting entirely of particles of polytetrafluoroethylene resin, said compo-

nents being fused together to form a continuous porous matrix with said polytetrafluoroethylene resin retaining said polytetrafluoroethylene fibers therein, said porous sintered blend having a porosity between around fifty (50) percent to ninety (90) percent by volume, the majority of the pores in said porous sintered blend having a size in the range between eighty (80) and four hundred (400) microns; and

the other layer being formed of a suitable biocompatible material and secured to said one layer to form the laminated material.

4,576,609

PROCESS FOR THE TREATMENT OF CELLULOSIC MATERIALS WITH OXIDIZING AGENTS AND MICROWAVES

Jacques Hageman, Corbais; Lucien Plumet, Vilvoorde, and Marcel Robberechts, Beersel, all of Belgium, assignors to INTEROX (Societe Anonyme), Brussels, Belgium

Filed Sep. 13, 1984, Ser. No. 650,066
Claims priority, application France, Sep. 16, 1983, 83 14900
Int. Cl.[4] D06L *3/04*
U.S. Cl. 8—103 11 Claims

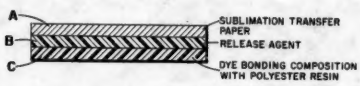
1. A process for the treatment of cellulosic materials with oxidising agents, wherein the cellulosic materials are exposed to the combined action of microwaves and at least one oxidising agent.

4,576,610

SUBLIMATION DYE TRANSFER PRINTING OF FABRICS

Henry Donenfeld, Melbourne, Australia, assignor to Doncroft Colors & Chemicals, Inc., Del.

Continuation of Ser. No. 228,735, Jan. 27, 1981, abandoned. This application Apr. 8, 1983, Ser. No. 482,014
Claims priority, application Australia, Mar. 25, 1980, PE2911
Int. Cl.[4] C09B *67/00*
U.S. Cl. 8—471 18 Claims



1. In a one step method for sublimation dye transfer printing of a sublimable dye onto fabric by applied heat from a sublimation dye transfer paper the improvement comprising applying a composition comprising a polyester resin having free carboxyl groups, a hardener and a dye binder which is a polymer of one or more monomers selected from the group consisting of unsaturated aliphatic hydrocarbons, acrylic acid esters, methacrylic acid esters, vinyl chloride, vinyl propionate, vinyl isobutyl ether, vinyl acetate, styrene and acrylonitrile, by transfer from the sublimation dye transfer paper to the fabric, in which the polyester resin securely bonds the dye to the fabric to yield a fabric having a soft hand and deep color which is fast to repeated laundering.

4,576,611

METHOD FOR PRODUCING RANDOM-APPEARING PATTERNS ON FABRIC: NODES AND LINE SEGMENTS

William M. Pascoe, Sr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 31, 1984, Ser. No. 615,988
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—482 13 Claims

1. A method for imparting a pattern of nodes and interconnecting line segments having a random appearance to a moving web of textile fabric comprising synthetic yarns and having a relatively hard calendered surface comprising the steps of:

(a) introducing pleats into said calendered fabric in a warp direction;

(b) introducing folds into said pleated fabric, which folds extend in a transverse direction relative to said pleats;

(c) wadding said pleated and folded fabric into a confined space in a manner which creates random-appearing creases in said fabric; and

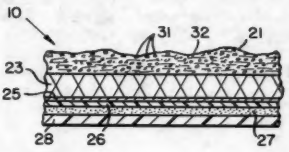
(d) heating said wadded and creased fabric in said confined space under conditions sufficient to heat set said creases in said fabric while moving said fabric through said confined space.

4,576,612

FIXED OPHTHALMIC LENS POLISHING PAD

Jayendra G. Shukla, Marietta, Ga.; Ki G. Sohn, Penn Yan, N.Y.; Carl Twickler, Milford, and Otto S. de Pierne, E. Norwalk, both of Conn., assignors to Ferro Corporation, Cleveland, Ohio

Filed Jun. 1, 1984, Ser. No. 616,175
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—295 10 Claims



1. A pad for polishing optical quality surfaces, including a flexible support, and a flexible layer of polishing material secured to one surface of said support, said layer of polishing material comprising,

a flexible matrix secured to said one surface of said support and containing a plurality of polishing particles ranging in size of from less than 0.5 microns to approximately 15 microns,

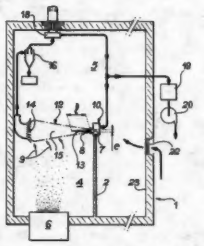
said matrix comprising in combination a latex material and a water soluble polymer, said polymer being present in a quantity approximately equal to or greater than that of said latex material, said matrix being water soluble, allowing a gradual release of said polishing particles as the matrix is dissolved by water used in a polishing operation.

4,576,613

PROCESS FOR CONFINING THE POLLUTION IN AN AREA

Francois Miline, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 11, 1983, Ser. No. 512,619
Claims priority, application France, Jul. 15, 1982, 82 12382
Int. Cl.[4] B61D *45/12*
U.S. Cl. 55—1 4 Claims



1. A process for the confinement of pollution of an area communicating with an external atmosphere through at least one opening, wherein a first gaseous jet is circulated along said opening, said gaseous jet covering the entire surface of said opening and being formed by a transition zone and a full jet development zone, the transition zone comprising a dart, said gaseous jet having a first side facing said area and a second side facing said external atmosphere, wherein the transition zone is

given a length equal to the range of the jet and wherein a second gaseous jet is circulated along said second face of the first jet, in the same sense of direction, said second gaseous jet having a first side adjacent to the second side of the first jet and a second side facing said external atmosphere, the injection flow rate of the second jet being greater than the injection flow rate of the first jet and the air flow induced by the first side of the second jet being substantially equal to the injection flow rate of the first jet.

4,576,614

PROCESS AND APPARATUS FOR SEPARATION OF A GASEOUS MIXTURE

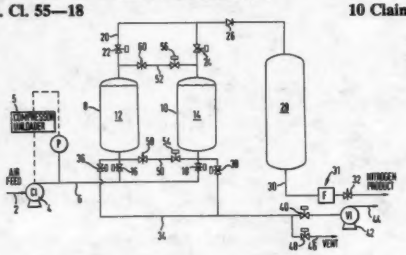
John W. Armond, Buckhurst Hill, and Kenneth C. Smith, Roydon, both of England, assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Oct. 26, 1981, Ser. No. 314,949

Claims priority, application United Kingdom, Oct. 30, 1980, 8035003

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—18 **10 Claims**



1. An improved process for the separation of a gas mixture comprising the steps of:

(a) repeatedly performing a cycle of operations employing a first vessel containing adsorbent which adsorbs one component of the gas mixture more readily then another or the other component of the gas mixture, the cycle of operations comprising:

(i) passing the gaseous mixture at super-atmospheric pressure through the vessel whereby said one component is adsorbed and a gas stream relatively lean in the adsorbed component flows out of the bed, this adsorption step of the cycle of operations lasting a chosen constant period of time;

(ii) regenerating the adsorbent by desorbing gas therefrom and causing a gas stream relatively rich in the desorbed gas to flow out of the vessel;

(b) repeatedly performing such a cycle of operations employing a second vessel containing said adsorbent, the cycles being phased relative to one another, such that at no time is step (i) or step (ii) in one cycle performed simultaneously with the corresponding steps in the other cycle; and

(c) passing the gas stream relatively lean in the adsorbed component into a reservoir; the improvement which comprises continously withdrawing the gas from the reservoir, measuring the flow of gas from the reservoir, and controlling the commencement of the adsorption step in one cycle, such that said adsorption step starts after completion of a preceding adsorption step in the other cycle but only upon the volume of gas withdrawn from the reservoir, measured from the commencement of the preceding adsorption step, having reached a predetemined value.

8. An improved process for the separation of air, comprising the steps of:

(a) repeatedly performing a cycle of operation employing a first vessel containing molecular sieve coke which adsorbs oxygen, carbon dioxide and water vapour more readily than nitrogen, the cycle of operations comprising;

(i) passing air at super-atmospheric pressure through the vessel whereby oxygen, carbon dioxide and water vapour are adsorbed and a gas stream relatively rich in nitrogen flows out of the bed, this adsorption step of the cycle of operations lasting a chosen constant period of time;

(ii) regenerating the molecular sieve coke by desorbing oxygen, carbon dioxide and water vapour therefrom and causing a gas stream relatively rich in said oxygen, carbon dioxide and water vapour to flow out of the vessel;

(b) repeatedly performing such a cycle of operations employing a second vessel containing molecular sieve coke, the cycles being phased relative to one another, such that at no time is step (i) or step (ii) in one cycle performed simultaneously with the corresponding step in the other cycle; and

(c) passing the nitrogen into at least one reservoir; the impovement comprising continuously withdrawing the nitrogen from the reservoir and measuring its flow rate by means of an integrating flowmeter, controlling the commencement of th adsorption step in one cycle, such that said adsorption step starts after a preceding adsorption step in the other cycle is completed but only upon the nitrogn withdrawn from the reservoir, measured from the commencement of the preceding adsorption step, having reached a predetermined value.

4,576,615

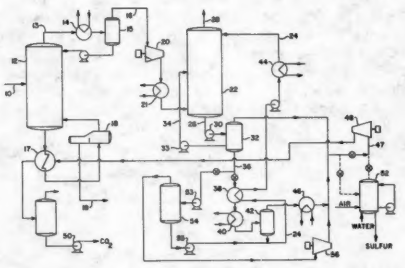
CARBON DIOXIDE HYDROCARBONS SEPARATION PROCESS

David Netzer, and Robert R. Huebel, both of Houston, Tex., assignors to The Randall Corporation, Houston, Tex.

Filed Aug. 20, 1984, Ser. No. 642,308

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—43 **7 Claims**



1. A process for the separation and recovery of CO_2 from an enhanced oil recovery or naturally occurring gas stream containing a mixture of at least 45 mol % CO_2 and less than 0.2 mol % H_2S with light hydrocarbons containing ethane as a primary light hydrocarbon component comprising the steps of:

(a) providing a gas stream of said mixture at a pressure of at least 500 psia,

(b) introducing said gas stream into the lower portion of an absorption system,

(c.) introducing a first liquid water phase containing at least 65 mol % water and containing less than about 1.4 weight % CO_2 into the top portion of said absorption system and a second liquid water phase containing at least 65 mol % water and containing between about 1.4 and 3.0 weight % CO_2 into the middle portion of said absorption system to form a downwardly flowing liquid water phase whereby said gas stream flows upwardly in contact with said down-

wardly flowing liquid water phase and said downwardly flowing liquid water phase absorbs CO_2 from said gas stream to form a CO_2-rich liquid water phase,

(d.) withdrawing said gas stream depleted in CO_2 from the top portion of said absorption system,

(e.) withdrawing said CO_2-rich liquid water phase from the bottom portion of said absorption system at a pressure of at least 500 psia,

(f.) separating gaseous CO_2 from said withdrawn CO_2-rich liquid water phase to form said recovered CO_2 and said first liquid water phase containing less than 1.4 mol % CO_2 and said second liquid water phase containing between about 1.4 and 3.0 weight % CO_2, and

(g.) recycling said separated first and second liquid water phases to the top and middle portions of said absorption system respectively.

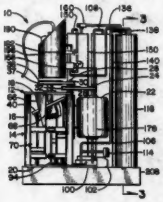
4,576,616
METHOD AND APPARATUS FOR CONCENTRATING OXYGEN

William R. Mottram, Boulder; Gene A. Fisher, Lafayette, and Louis Feierabend, Boulder, all of Colo., assignors to Proto-Med. Inc., Boulder, Colo.

Continuation of Ser. No. 465,479, Feb. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 402,270, Jul. 27, 1982, Pat. No. 4,502,873. This application Sep. 4, 1984, Ser. No. 647,857

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—68 **21 Claims**



1. Oxygen concentrator apparatus, comprising:

two beds of zeolitic material, each bed being in an enclosed container;

a pump for pumping air into said zeolitic bed, said pump having an internal chamber, an intake port for conducting air into said chamber, an exhaust port for conducting air out of said chamber, and air moving means for moving air from said intake port to said exhaust port, said exhaust port being sufficiently large in relation to said chamber to result in substantially isothermal air flow through said pump;

sequence valve means for directing air from said pump first to one of said zeolitic beds while exhausting the other zeolitic bed to the atmosphere, and alternately, for directing air from said pump to said other zeolitic bed while exhausting said one zeolitic bed to the atmosphere, said valve means having internal ducts and ports therein at least as large in cross-sectional area as said exhaust port on said pump such that there is no restriction to air flow therethrough, and

air flow pipes connecting said exhaust port to said sequence valve means and connecting said sequence valve means to said beds, all of said air flow pipes having cross-sectional areas at least as large as the cross-sectional of said exhaust port such that there is no restriction to air flow therethrough.

9. In the method of concentrating oxygen, utilizing the steps of pumping air through one zeolitic bed while purging and exhausting air from a second zeolitic bed by venting said second zeolitic bed to the atmosphere from one end and directing a portion of oxygen-enriched air from said first bed into the opposite end of said second bed and vice versa in sequential steps, the improvements comprising the steps of pumping and flowing the air isothermally into said beds through conduits and valves, all of which have no restrictions in cross-sectional area therethrough from the air pump to the beds.

4,576,617
APPARATUS COMPRISING THE COMBINATION OF FILTER APPARATUS AND REGENERATION APPARATUS AND PROCESS FOR REGENERATING THE FILTER APPARATUS USING THE REGENERATION APPARATUS

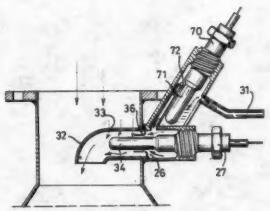
Gérard Renevot, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 7, 1984, Ser. No. 618,261

Claims priority, application France, Jun. 16, 1983, 83 09951

Int. Cl.⁴ B01D *46/04;* **F01N** *3/18, 3/36*

U.S. Cl. 55—96 **15 Claims**



1. Apparatus for regenerating a clogged particle filter into which exhaust gas containing carbon particles from a hydrocarborn engine is introduced by way of a conduit in fluid communication with the particle filter, said apparatus comprising:

(a) a tank for containing an organic liquid;

(b) a first prechamber in which the organic liquid is cracked;

(c) a first fluid passageway in fluid communication with said tank and with said first prechamber;

(d) a first glow plug disposed in said first prechamber;

(e) a second prechamber located in said first fluid passageway between said tank and said first prechamber;

(f) a second glow plug disposed in said second prechamber; and

(g) a second fluid passageway in fluid communication with said first prechamber and adapted to be placed in communication with the conduit.

4,576,618
SELF-CLEANING COLLECTING DEVICE

James E. Wooldridge; Robert E. Osborne, and Robert W. Sexton, all of Louisville, Ky., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 408,611, Aug. 16, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,534

Int. Cl.⁴ B03C *3/01*

U.S. Cl. 55—122 **8 Claims**

1. A self-cleaning collecting device in a recirculating gas system for removing noxious vapors and particulates from a dirty gas stream comprising:

A flow-through housing having a base and a top with a dirty gas inlet at the base of the housing, a clean gas outlet at the top of the housing, and a gas treating passage extending upwardly through the housing between the gas inlet and the gas outlet for conducting the gas stream through the housing, at least one access door on said housing for servicing filters and collecting units;

a liquid bath treating section including, an apertured plate

having an upper surface secured in flow-through relation across the passage;

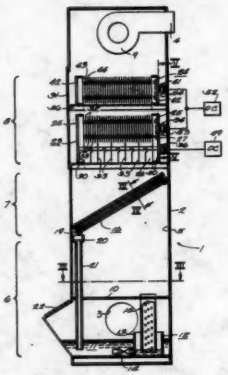
a reservoir receiving gas treating liquid aligned within the housing beneath the apertured plate;

pump means aspirating a predetermined flow of treating liquid from the reservoir and dispersing it on the upper surface of the apertured plate so as to migrate to the apertures in the plate to effect entrainment of the noxious vapors and larger particulates in a mist of liquid droplets formed in the gas stream as it passes through the plate;

a self-cleaning separating section including,

a filter panel support defining a drain trough on one side of said housing;

a planar filter panel carried on said filter panel support and formed of a fiberous material secured in flow-through relation diagonally across the passage for convenient



replacement above the apertured plate separating the entrained particulates and the liquid from the gas stream as it flows through the panel and draining accumulated liquid carrying particulates to the lower edge of the filter panel;

liquid return means including said drain trough and a drain passage circulating liquid accumulating from the filter panel back to the reservoir to maintain a flow of liquid within the panel which acts to wash the particulates from the panel; and

at least one electrostatic collecting unit including a plurality of spaced parallel collecting electrode plates secured in flow-through relation across the passage between the filter panel and the gas outlet separating the smaller particulates from the gas stream and thereby clean the gas stream for recirculation in the gas system.

4,576,619

DUST RECOVERY APPARATUS

Graham P. Manning, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

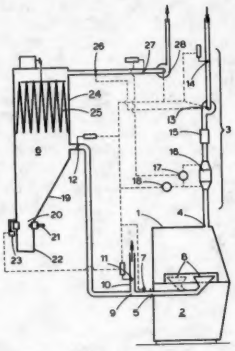
Filed Jan. 17, 1984, Ser. No. 571,604

Claims priority, application United Kingdom, Feb. 2, 1983, 8302835

Int. Cl.[4] B01D *46/46, 50/00*

U.S. Cl. 55—213 **6 Claims**

1. A dust recovery apparatus comprising a housing and a collector; said housing having an outlet and outlet; means for passing air through the apparatus at a predetermined rate while maintaining a slight positive pressure in the housing, said means including an inlet duct having a shut off damper and being connected to said inlet, an air supply fan and a regulator disposed in spaced relationship for introducing air into said housing; an outlet duct in said housing connected to said collector, said outlet duct containing an air flow rate sensor between the outlet and the collector and a valve between the sensor and collector, said sensor being connected to the shut



off damper, air supply fan, and valve in order to maintain a constant air flow and said collector being connected to an exhaust outlet.

4,576,620

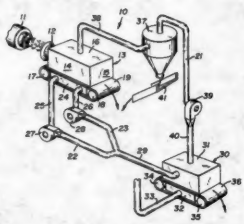
APPARATUS FOR THE PRODUCTION OF MINERAL FIBERS HAVING SUPPLEMENTAL COLLECTION CHAMBER EXHAUST

William F. Porter, Lake Zurich; Michael J. Porter, Hanover Park, and Dwight E. Johnson, Villa Park, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 4, 1984, Ser. No. 677,728

Int. Cl.[4] C03B *37/06*

U.S. Cl. 65—9 **4 Claims**



1. An apparatus for forming and collecting mineral fibers, comprising:

(a) an apparatus for melting mineral slag and producing mineral fibers,

(b) a collection chamber having an inlet adapted to receive a mixture of air and mineral fibers from said fiber producing apparatus, separating the mineral fibers from the air and depositing the fibers in a packaging area, said collection chamber comprising a housing, a foraminous conveyor means for moving collected mineral fibers out of said chamber mounted below said housing and comprising an endless foraminous belt mounted on rotatable rollers and having an exhaust plenum mounted within said endless belt adapted to exhaust air from said collection chamber through said foraminous belt and thereby reducing the air pressure within said collection chamber, effluent duct means connected to said plenum and means for exhausting air from said effluent duct means,

(c) a cyclone exhaust apparatus having a duct connected to an upper wall of said collection chamber for exhausting air and mineral fibers therefrom, thereby further reducing the

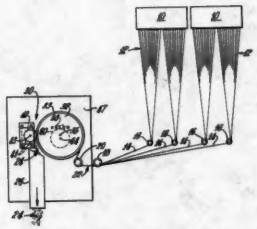
pressure within said chamber, said cyclone exhaust apparatus being adapted to discharge collected mineral fibers therefrom.

4,576,621

APPARATUS FOR PRODUCING CHOPPED STRANDS OF GLASS FIBERS

Robert N. Chappelear, Anderson, and Alex P. Symborski, Pendleton, both of S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 7, 1985, Ser. No. 689,425
Int. Cl.[4] C03B *37/16*
U.S. Cl. 65—10.2 **8 Claims**



1. Apparatus for drawing molten streams of glass into filaments and severing the filaments into discrete segments comprising:

a first rotatable member having an axis of rotation;

a second rotatable member positioned adjacent said first member adapted to sever said filaments to form said discrete segments as the filaments advance between the first and second rotatable members;

means for rotating said first member about said axis to attenuate said streams into said filaments;

a rotatable carriage means having an axis of rotation, the axis of rotation of said first rotatable member being spaced from the axis of rotation of said carriage;

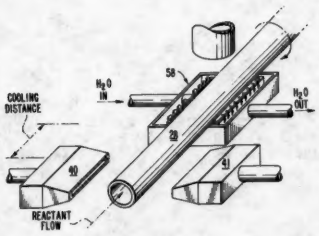
actuator means for rotating said carriage means to laterally move the axis of rotation of said first member along a predetermined path to increase or decrease the distance between the axis of rotation of the first member and the axis of rotation of the second member.

4,576,622

MANUFACTURE OF PREFORMS FOR ENERGY TRANSMITTING FIBERS

Lothar Jung, 1355 Plymouth Rd., Bridgewater, N.J. 08807

Filed Nov. 28, 1983, Ser. No. 555,484
Int. Cl.[4] C03B *37/02*
U.S. Cl. 65—13 **6 Claims**



1. A glass lathe for producing a fused quartz preform capable of being drawn into an energy transmitting fiber, said lathe comprising:

a lathe bed and a tail stock and a head stock mounted on said bed and means for moving said tail stock along the length of said bed;

chuck means associated with said head stock and said tail stock for mounting a starter tube and the fused quartz preform formed therefrom and means for rotating the tube or preform while mounted in said chuck;

a carriage slidably mounted on said lathe bed and means for driving said carriage back and forth along the length of said lathe bed;

means for introducing gases into the lumen of the rotating tube mounted on said lathe;

burner means mounted on said carriage for heating the tube or preform to decompose said introduced gases, said burner means comprising a burner mounted vertically above said rotating tube or preform;

a reservoir for a coolant mounted on said carriage and means for establishing a fountain in said reservoir to immerse a section of the lower portion of the rotating tube or preform in the coolant when said vertically mounted burner is not operating on said tube or preform; and

means for feeding solid quartz particles downwardly through the flame of said vertically mounted burner onto said rotating tube or preform.

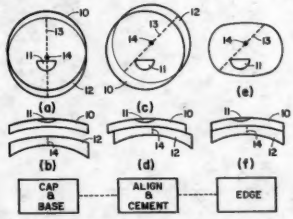
4. The apparatus of claim 1 wherein said burner means further comprises burners mounted in a facing relationship on either side of the rotating tube and horizontally spaced from said reservoir to allow for cooling prior to contact to said coolant.

4,576,623

METHOD FOR MAKING MULTIFOCAL OPHTHALMIC LENS

George H. Mann, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,940
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] C03C *21/00*
U.S. Cl. 65—30.14 **1 Claim**



1. A method for making a laminated, chemically strengthened multifocal ophthalmic lens which comprises the steps of:

(a) selecting a glass blank for a multifocal cap element, the blank consisting of a spherical miniscus lens with a concave back surface and with a convex front surface having a recess into which an ophthalmic multifocal segment glass element has been fused;

(b) finishing the front and back surfaces of the blank to provide a finished multifocal cap element with front and back surfaces of matching diopter curvature and a finished thickness not exceeding about 1.5 mm;

(c) providing a glass base element consisting of a spherical miniscus lens with a convex front surface and a concave back surface, the surface curvature of said front surface matching the curvature of the concave back surface of said cap element, and the concave back surface having

been ground to provide at least cylinder corrective power about a cylinder axis in the element;

(d) temporarily bonding the cap element to the base element with a soluble bonding adhesive to provide a bonded composite, the back surface of the cap element being bonded to the front surface of the base element and the relative positions of said elements being adjusted prior to bonding to provide a prescribed angular relationship between the cylinder axis of the base element and the multifocal segment of the cap element;

(e) edging the bonded composite to provide an edge configuration for a selected eyeglass frame;

(f) separating the edged cap and base elements and subjecting the separate cap and base elements to a chemical ion-exchange tempering process to provide strengthened elements; and

(g) permanently cementing the strengthened cap and base elements together to provide a finished laminated, chemically strengthened multifocal ophthalmic lens.

4,576,624

MACHINE FOR FORMING HOLLOW ARTICLES OF VITREOUS MATERIAL

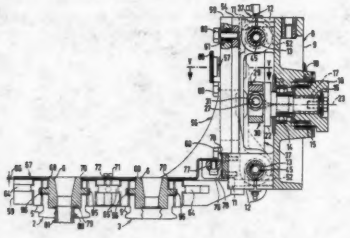
Hans-Georg Seidel, Rinteln, Fed. Rep. of Germany, assignor to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,238

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024428

Int. Cl.⁴ C03B *9/14, 9/40*

U.S. Cl. 65—300 **12 Claims**



1. A machine for forming a hollow article of vitreous material, comprising at least one forming means having a neck ring including a pair of separable neck ring halves; holding means for holding said at least one forming means and including a pair of holding elements each holding a respective one of said neck ring halves; transporting means for transporting said forming means along a predetermined path and having guide bars; carriages displaceably mounted on said guide bars of said transporting means, each of said holding elements for holding a respective one of said neck ring halves being releasably connected with one of said carriages so that said holding elements can be removed from any hung on said carriages, each of said holding elements being provided with at least one hook and suspended by said at least one hook on the respective one of said carriages; driving means connected with said carriages for moving each of said holding elements relative to said guide bars of said transporting means, between closed and open end positions; and locking means connected with said carriages for locking each of said holding elements in at least said closed end position.

4,576,625

FERTILIZERS CONTAINING UREA WITH UREASE INHIBITORS

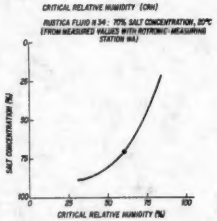
Jürgen Norden, Bochum; Heinrich Aigner, Duelman; Fritz Schindler, Gelsenkirchen, and Reinhard Samblebe, Herne, all of Fed. Rep. of Germany, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,282

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322724

Int. Cl.⁴ C05G *3/02, 3/08*

U.S. Cl. 71—3 **27 Claims**



1. Fertilizers containing urea with urease inhibitors, wherein the urease inhibitors are bromo-nitro compounds having the formula:

wherein A_1 is $(CH_2)_{n1}X_1$, and A_2 is $(CH_2)_{n2}X_2$, wherein both n_1 and n_2 and X_1 and X_2 are the same or different, the alkyl groups of A_1 and A_2 are straight-chain or branched-chain alkyl groups, and the substituents X_1 and X_2 are attached to any one of the carbon atoms of the alkyl groups, and n_1 and n_2 are 0 to 6, X_1 and X_2 are H or YR, wherein Y is —O—, —S— or —NH— and R is H or a straight or branched chain C_1–C_6 alkyl, cyclopent(en)yl, cyclohex(en)yl or phenyl group having one to three methyl groups or

attached thereto, and R_1 is H or a straight or branched chain C_1–C_6 alkyl, cyclopent(en)yl or cyclohex(en)yl group having one to three methyl groups or

attached thereto.

4,576,626
FOLIAGE FERTILIZERS

Kurt H. Bauer, Freiburg; Miklos Ghyczy; Eugen Etschenberg, both of Cologne, and Heinrich Osthoff, Huerth, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 490,968, May 2, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,985

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218028

Int. Cl.[4] C05C *9/00*

U.S. Cl. 71—28 4 Claims

1. A process for the preparation of phospholipid containing foliage fertilizers comprising one or several macronutrients and 10 to 50% by weight (based on the total weight of the nutrients) of one or several phospholipids consisting of the steps of:

(1) dissolving said one or several phospholipids in a solvent by stirring the phospholipids and solvent until a first solution is formed;

(2) dissolving said one or several macronutrients together with any conventional adjuvants in a solvent in the presence of a polyol by stirring the macronutrients, any adjuvants, solvent and polyol until a second solution is formed; and

(3) combining and stirring said first and second solutions with water to provide upon the blending thereof an aqueous emulsion or suspension useful as a foliage fertilizer.

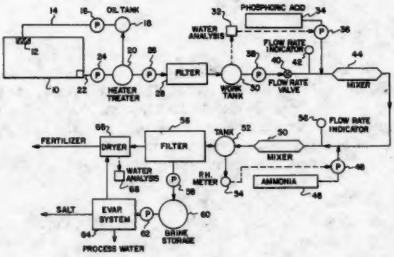
4,576,627
METHOD OF PROVIDING FERTILIZER FROM BRINES

William B. Hughes, 6605 Bob-O-Link Dr., Dallas, Tex. 75214

Filed Sep. 4, 1984, Ser. No. 647,085

Int. Cl.[4] C05B *11/10*

U.S. Cl. 71—41 14 Claims



1. A method for recovering a fertilizer from a brine containing divalent metal cations comprising the steps of:

(a) first adding phosphoric acid to said brine and agitating said phosphoric acid and said brine to form a mixture;

(b) then adding ammonia to said mixture to adjust the pH of said mixture to between 4.5 and 6.0 and agitating said mixture to precipitate substantially all of the divalent metal cations contained in said mixture, the precipitate comprising divalent metal ammonium phosphates which are useful as a fertilizer; and

(c) separating said precipitate from said mixture.

4,576,628
OXIME ETHERS, COMPOSITIONS CONTAINING THEM AND THE USE THEREOF

Henry Martin, Allschwil, and Urs Fricker, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

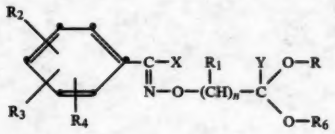
Division of Ser. No. 473,905, Mar. 10, 1983, Pat. No. 4,530,716. This application May 13, 1985, Ser. No. 733,352

Claims priority, application Switzerland, Mar. 15, 1982, 1609/82

Int. Cl.[4] C07C *131/00*; A01N *33/06, 37/00, 37/10, 37/18, 37/34, 37/36, 43/08, 43/28, 43/40, 43/64, 43/82*

U.S. Cl. 71—88 16 Claims

1. An oxime ether of the formula



wherein n is 1 or 2

each of R_1 and R_2 is hydrogen or C_1–C_4-alkyl,

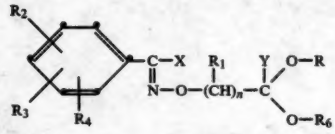
each of R_3 and R_4 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy or nitro

R_5 and R_6 are independently of each other C_1–C_4 alkyl or C_3–C_4 alkenyl

X is a fluorinated C_1–C_3 alkyl radical which may also additionally contain chlorine and

Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy.

9. A composition for controlling weeds in crops of culture plants which comprises (a) a herbicidally effective amount of a herbicide selected from the group consisting of thiocarbamates, haloacetanilides, phenoxyphenoxypropionates, pyridyloxyphenoxypropionates and dinitroanilines, and (b) as crop safening agent an oxime ether of the formula



wherein n is 1 or 2

each of R_1 and R_2 is hydrogen or C_1–C_4-alkyl,

each of R_3 and R_4 is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkyoxy or nitro,

R_5 and R_6 are independently of each other C_1–C_4 alkyl or C_3–C_4 alkenyl

X is a fluorinated C_1–C_3 alkyl radical which may also additionally contain chlorine and

Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy.

4,576,629
HERBICIDAL THIADIAZOLE UREAS

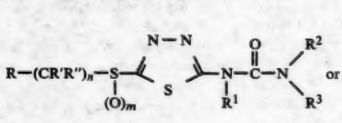
Robert B. Morland; Anson R. Cooke, both of Durham, N.C., and John R. Bishop, Hatfield, Pa., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 15, 1984, Ser. No. 589,724

Int. Cl.[4] A01N *43/02*

U.S. Cl. 71—90 28 Claims

1. Compounds having the structural formula:



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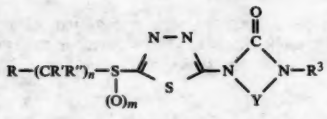


wherein

R is:

(a) a substituted or unsubstituted radical having the structural formula:

wherein A is an alkylene or alkenylene chain having 5, 6 or 7 ring members which are replaced by one to three heteroatoms, in any location and in any combination, selected from the groups of oxygen, nitrogen and sulfur, wherein the permissible substituents are one or more alkyl, alkoxy, carboalkoxy, monoalkylamino, dialkylamino, amido, alkylthio, phenyl, halogen, trihalomethyl hydroxy, cyano, mercapto or nitro substituents provided that any substituent may not have more than eight aliphatic carbon atoms: or

(b) a substituted or unsubstituted radical having a structural formula:

wherein A is as defined above and A′ is an alkylene or alkenylene chain having 3, 4 or 5 members which may be replaced by up to three hetero atoms, in any location and in any combination, selected from the group of oxygen, nitrogen and sulfur, or A′ is a 4-membered polyunsaturated chain, wherein the permissible substituents are one or more alkyl, alkoxy, carboalkoxy, monoalkylamino, dialkylamino, amido, alkylthio, phenyl, halogen, trihalomethyl hydroxy, cyano, mercapto or nitro substituents;

R′ and R″ are independently hydrogen, alkyl, cycloalkyl, alkoxy, carboalkoxy or halogen, provided that R′ and R″ independently may not contain more than four carbon atoms;

n is an integer from 1 to 5;

m may be 0, 1 or 2

R^1, R^2 and R^3 are independently hydrogen, cylopentyl, cyclohexyl, cyclopropyl, phenyl, alkyl or alkoxy each containing no more than eight carbon atoms; and

Y is a substituted or unsubstituted divalent alkylene or alkenylene chain having two or three members wherein any one carbon atom in said chain may be replaced with an amino group and any one or two carbon atoms in said chain may be replaced with a carbonyl group, and wherein the permissible substituents are one or more halo, alkoxy or hydroxy.

4,576,630

SUBSTITUTED 4,5-DIMETHOXYPYRIDAZONES, HERBICIDES CONTAINING THESE COMPOUNDS, AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Adolf Parg, Bad Durkheim; Gerhard Hamprecht, Weinheim; Hubert Sauter, Mannheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

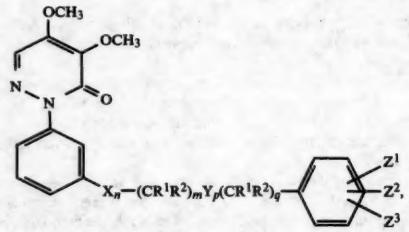
Filed Jun. 6, 1984, Ser. No. 617,929

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321007

Int. Cl.⁴ A01N *43/58*; C07D *237/16*

U.S. Cl. 71—92 **15 Claims**

1. A substituted 4,5-dimethoxypyridazone of the formula



(I)

where X and Y independently of one another are each oxygen, sulfur, a sulfinyl group or a sulfonyl group, R^1 and R^2 independently of one another are each hydrogen or C_1–C_4-alkyl, Z^1, Z^2 and Z^3 independently of one another are each hydrogen, halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylmercapto, C_1–C_4-haloalkylmercapto, C_1–C_4-alkylsulfinyl or C_1–C_4-alkylsulfonyl, n and p are each 0 or 1, m is 1 to 8 and q is 0 to 8.

6. A herbicide containing inert additives and an effective amount of a 4,5-dimethoxypyridazone of the formula I as defined in claim 1.

4,576,631

CERTAIN ARYLOXYPHENOXY OXOIMIDAZOLIDINES AND METHOD OF USE

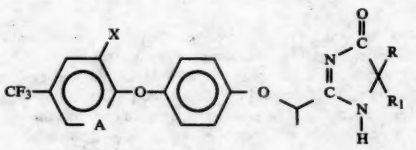
Charles G. Carter, San Francisco, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 25, 1984, Ser. No. 624,066

Int. Cl.⁴ A01N *43/50*; C07D *401/02*

U.S. Cl. 71—92 **15 Claims**

1. An aryloxyphenoxyoxoimidazoline having the formula



wherein

A is CH or nitrogen;

X is hydrogen or chlorine; and

R and R_1 are alkyl groups having from 1 to 4 carbon atoms.

4,576,632
BENZOFURAN SULFAMATES

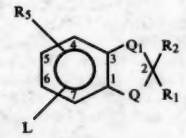
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 387,951, Jun. 15, 1982, Pat. No. 4,494,979, which is a continuation-in-part of Ser. No. 286,602, Jul. 24, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 669,016

Int. Cl.[4] **C07D** *405/12;* **A01N** *43/66, 43/68, 43/70*

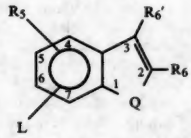
U.S. Cl. 71—93 **33 Claims**

1. A compound of the formula:



(I)

or



(II)

wherein

Q is O, S or SO_2;

Q_1 is CR_3R_4 or O;

L is $OSO_2NHCONHA$;

R_1 is H or C_1–C_3 alkyl;

R_2 is H or CH_3;

R_3 is H or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3; OCH_3; Cl, Br, NO_2, CO_2R_7, SO_2R_8, OSO_2R_9 or $SO_2NR_{10}R_{11}$;

R_6 is H or C_1–C_3 alkyl;

R_6' is H or CH_3;

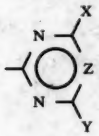
R_7 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_8 is C_1–C_3 alkyl;

R_9 is C_1–C_3 alkyl or CF_3;

R_{10} and R_{11} are independently C_1–C_2 alkyl;

A is



X is CH_3 or OCH_3;

Y is Cl, CH_3, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, $CH(OCH_3)_2$ or

and

Z is N;

provided that

(1) L is fixed at the 4- or 7-position; and when L is at the 4-position, then R_5 is at the 5-position, and when L is at the 7-position, then R_5 is at the 6-position;

(2) in Formulae I and II, when Q is O and L is in the 4position, and R_5 is other than H, then R_1 and R_6 are other than H;

(3) in Formula II, when Q is O and L is in the 7-position, and R_5 is other than H, then R_6 and R_6' are other than H;

(4) in Formula II, when Q is S or SO_2 and R_5 is other than H, Br or NO_2, then R_6 and R_6' are other than H;

(5) in Formula I, when Q is S, then R_5 is other than SO_2R_8;

(6) when Q_1 is O, then Q is O and R_5 is H; and

(7) the total number of carbon atoms in R_1 to R_4 are less than or equal to 4.

4,576,633
HERBICIDAL SULFONAMIDES

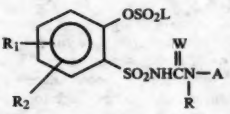
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 477,969, Mar. 23, 1983, Pat. No. 4,515,624. This application Feb. 1, 1985, Ser. No. 697,375

Int. Cl.[4] **C07D** *25/18, 401/12;* **A01N** *43/70, 43/68*

U.S. Cl. 71—93 **17 Claims**

1. A compound of the formula:



wherein

W is O or S;

R is H or CH_3;

Q is O, or NR_3;

L is NR_5R_6 or $N(OCH_3)CH_3$;

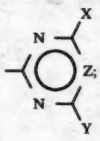
R_1 is H, F, Cl, Br, CH_3, OCH_3, CF_3 or NO_2;

R_2 is H or Cl;

R_3 is H or C_1–C_3 alkyl;

R_5 and R_6 are independently C_1–C_3 alkyl, or R_5 and R_6 may be taken together to be $-(CH_2)_4-$, $-(CH_2)_5-$ or $-(CH_2)_2O(CH_2)_2-$;

A is



A-1

X is CH_3, OCH_3, CH_2CH_3, OCH_2CH_3 or OCF_2H;

Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1-3 atoms of (a) F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OCH_2CH_3$, C_1–C_4 alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$, $CH(OCH_2CH_3)_2$,

OCH_2CF_3, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br or GCF_2T wherein G is O or S and T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;

Z is N;

provided that

when W is S, then R is H;

and their agriculturally suitable salts.

4,576,634
PROCESS FOR THE PREPARATION OF CHALCOGENIDE ALLOYS

Santokh S. Badesha, Pittsford; Damodar M. Pai, Fairport; Kathleen M. Carmichael, Williamson, and Ihor W. Tarnawskyj, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1985, Ser. No. 765,758
Int. Cl.⁴ C01B *19/00*
U.S. Cl. 75—0.5 A **30 Claims**

1. A process for the preparation of high purity chalcogenide alloys which comprises providing an acid mixture of chalcogens; forming a solution thereof; and thereafter reacting the solution with a reducing agent.

4,576,635
PROCESS FOR PRODUCING FERROMAGNETIC METAL POWDER

Hiroaki Araki, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1985, Ser. No. 705,975
Claims priority, application Japan, Feb. 27, 1984, 59-35582
Int. Cl.⁴ B22F *1/02*; H01F *1/33*
U.S. Cl. 75—0.5 AA **7 Claims**

1. In a process for producing a ferromagnetic metal powder comprising treating acicular iron oxyhydroxide or an acicular metal oxyhydroxide composed mainly of iron with a silicon compound, dehydrating the treated material by heating the material in a non-reducing atmosphere to produce iron oxide particles or metal oxide particles composed mainly of iron, and reducing the resulting iron oxide particles or metal oxide particles composed mainly of iron by heating in a reducing atmosphere to produce iron powder or a metal powder composed mainly of iron, the improvement in which the dehydration by heating in a non-reducing atmosphere is performed at a temperature of from 300° to 800° C. and the iron oxide particles or the metal oxide particles composed mainly of iron are treated with a silicon compound prior to the reduction by heating in a reducing atmosphere.

4,576,636
PROCESS FOR BENEFICIATING OXIDIC ORES

Michael Robinson, Wooton, and Harry B. Wilson, North Thoresby, both of England, assignors to SCM Chemicals Limited, London, England

Filed Feb. 17, 1981, Ser. No. 234,987
Claims priority, application United Kingdom, Feb. 19, 1980, 8005517
Int. Cl.⁴ C01G *49/10*
U.S. Cl. 75—1 R **19 Claims**

1. A process for the beneficiation of an iron-containing oxidic material, which comprises;

(a) chlorinating iron values of the material by forming a fluidised bed of particles of the material in admixture with particles of carbon, the carbon being present in the fluidised bed in at least sufficient quantity to react with any oxygen added to or evolved in the bed, and the temperature of the fluidised bed being from 800° C. to 1100° C., admitting to the fluidised bed a chlorine containing gas giving a concentration of chlorine of from 20% to 60% by volume of gases added to the bed and reacting the chlorine with iron values present in the ore to produce iron chloride predominantly in the form of ferrous chloride,

(b) contacting the gaseous effluent from the fluidised bed in which iron values in the material have been chlorinated; hereafter referred to as the chlorination fluidised bed; the said effluent containing the said ferrous chloride in vapour form, with a quantity of oxygen controlled to oxidise more than 50% but less than 100% on a molar basis, of the ferrous chloride in the effluent according to the equation $3FeCl_2+0.75O_2=0.5Fe_2O_3+2FeCl_3$ to produce a mixture of iron chloride and ferric oxide

(c) condensing iron chloride contained in the said mixture and separating the condensed iron chloride from the gaseous effluent from the fluidised bed,

(d) revolatilising condensed iron chloride,

(e) contacting revolatilised iron chloride with oxygen to oxidise the iron chloride so contacted to ferric oxide with the evolution of chloride and

(f) recycling chlorine so evolved, as chlorine containing-gas, to the chlorination fluidised bed.

4,576,637
PROCESS FOR PREPARING SILICON-BASE COMPLEX FERROUS ALLOYS

Istvan Tamas; Szilard Riederauer, both of Budapest, and Janos Kovacs, Salgotarjan, all of Hungary, assignors to Vasipari Kutato es Fejleszto Vallalat, Budapest, Hungary

Filed Sep. 18, 1984, Ser. No. 651,849
Int. Cl.⁴ C22B *4/00*
U.S. Cl. 75—10 R **2 Claims**

1. A process for the preparation of alloys of at least three metals of which two are iron and silicon, comprising

forming pellets containing at least about 50% by weight of an oxide of at least one said metal and a carbonaceous reducing agent in an amount such that the quantity of carbon is either 1.05 to 1.35 times higher than that required to transform said oxide to carbide or 0.66 to 0.02 times the quantity required to reduce said oxide, the pellets melting upon heating at a temperature no lower than 1600° C.;

assembling a charge comprised of

(a) said pellets

(b) carbon-deficient lumps or pellets of an oxide of a said metal other than the metal of the first-mentioned pellets, and

(c) a lumpy carbonaceous material;

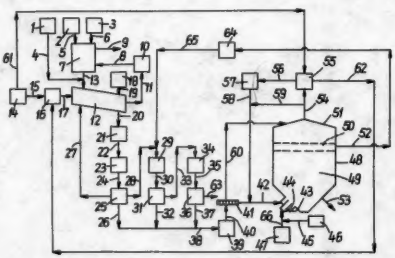
the charge being free from boron trioxide and containing carbon in an amount equal to 0.82 to 0.99 times the quantity necessary to reduce all oxides of the charge; and

reducing the charge in an electric arc furnace.

4,576,638
PROCESS FOR THE PRODUCTION OF FERROMANGANESE

Hermann Doerr, Muelheim; Thomas Hoster; Dieter Neuschuetz, both of Essen; Dietrich Radke, Ratingen; Wilhelm Janssen, Muelheim, and Klaus Ulrich, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschraenkter Haftung, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,324
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347685
Int. Cl.⁴ C22B *47/00*
U.S. Cl. 75—80 **20 Claims**



1. Process for the production of ferromanganese with a carbon content of from 0.05 to 8% from iron-containing manganese ore by heating a mixture of manganese ore, solid carbon-containing fuel and slag-forming constituents in a rotary

kiln, and subsequently melting, in a melting furnace, ferromanganese from the reaction product that is removed from the rotary kiln and cooled down, comprising:

(a) forming a mixture of manganese ore, coal and slag-forming constituents at an ore-coal ratio of 1:0:4 to 1:2, in which mixture slag-forming constituents CaO, MgO, Al_2O_3 and SiO_2 are present in an amount such that in the slag a $(CaO+MgO)/(Al_2O_3+SiO_2)$ ratio exists of 1:0:3 to 1:4 and the Al_2O_3/SiO_2 ratio is 1:0:3 to 1:9;

(b) heating the mixture in the rotary kiln from 20 to 240 minutes in a CO-containing atmosphere at a temperature of from 1200° to 1350° C. to form a reaction product and removing the reaction product from the rotary kiln;

(c) crushing the reaction product removed from the rotary kiln to a particle diameter of less than 15 mm;

(d) separating the crushed reaction product by density separation into a coal-containing fraction which is reintroduced into the rotary kiln, at least one metal-containing slag-rich fraction and an alloy fraction to be delivered to the melting furnace; and

(e) delivering the alloy fraction to the melting furnace and melting the alloy fraction in the melting furnace at temperatures of from 1400° to 1600° C.

4,576,639

HYDROGEN STORAGE METAL MATERIAL

Ryoichi Suzuki; Jiro Ohno, and Hisashi Gondo, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

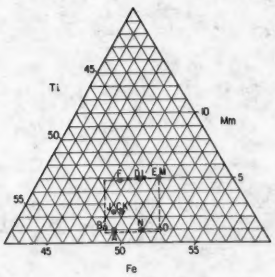
Filed May 23, 1984, Ser. No. 613,343

Claims priority, application Japan, May 26, 1983, 58-93273

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] C22C *30/00, 38/00*

U.S. Cl. 75—123 E **2 Claims**



1. A hydrogen storage metal material, namely Ti—Fe—Mm, consisting essentially of Ti in an atomic ratio in the range of from 0.90 to 1.05 with respect to Fe, Mm in an atomic ratio in the range of from 0.015 to 0.1 with respect to Fe, and the remainder Fe.

4,576,640

HYDROGEN STORAGE MATERIAL

Malcolm J. Wootton, and Ivor R. Harris, both of Birmingham, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

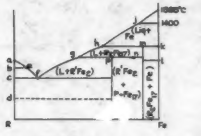
Filed Jun. 29, 1984, Ser. No. 626,235

Claims priority, application United Kingdom, Jul. 2, 1983, 8318009

Int. Cl.[4] C22C *38/00*

U.S. Cl. 75—123 E **19 Claims**

1. A hydrogen storage material for releasably storing hydrogen having a microstructure comprising an alloy phase of the general formula R_2Fe_{17}, wherein R comprises cerium and lanthanum and, optionally, at least one other rare earth element, and wherein a microstructure also contains from about 2 to 35% by weight based on the total weight of all phases a eutectic of the formula $R'/R'Fe_2$, wherein R' is lanthanum-starved R; wherein said alloy phase of the generalised formula R_2Fe_{17} is present in an amount of not less than 40% by weight



	°C	at. %	°C	at. %	°C	at. %
a	1765	-	917	-	1050	-
b	1715	-	730	-	940	-
c	1662	-	~660	-	940	-
d	1317	-	-	-	-	-
e	1715	~9.8	730	~9.1	1080	~3.6
f	1662	0.5	~660	60–65	940	~1.75
g	1662	~9.5	670	65–66	1150	~1.47
h	1080	~3.8	1105	4.5	1156	~3.39
j	1400	~1.8	1400	~1.4	1400	~1.17
k	1080	-	1105	-	1155	-
l	911	-	930	-	1028	-
m	1080	~1.1	1105	~1.1	1155	~1.11
n	1662		670	-	1150	-
p	1662	~3.4	670	~3.3	1150	~3.35

of the material, and said material contains less than 60% by weight of cerium based on the total amount of cerium, lanthanum and, if present, said at least one other rare earth element.

4,576,641

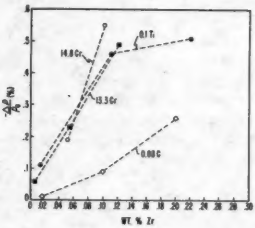
AUSTENITIC ALLOY AND REACTOR COMPONENTS MADE THEREOF

John F. Bates, Ogden, Utah; Howard R. Brager, Richland, Wash., and Michael K. Korenko, Wexford, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 2, 1982, Ser. No. 414,167

Int. Cl.[4] C22C *38/22*

U.S. Cl. 75—128 P **27 Claims**



1. An austenitic nickel-chromium-iron base alloy consisting essentially of:

about 0.04 to 0.09 wt.% carbon;

about 1.5 to 2.5 wt.% manganese;

about 0.5 to 1.6 wt.% silicon;

about 0.035 to 0.08 wt.% phosphorus;

about 13.3 to 16.5 wt.% chromium;

about 13.7 to 16.0 wt.% nickel;

about 1.0 to 3.0 wt.% molybdenum;

about 0.10 to 0.35 wt.% titanium;

up to about 0.20 wt.% zirconium;

wherein for zirconium contents from 0.02 to 0.20 wt.% the carbon and phosphorus contents are selected from the group consisting of about 0.05 to 0.08 wt.% phosphorus and about 0.04 to 0.09 wt.% carbon, about 0.035 to 0.08 wt.% phosphorus and about 0.07 to 0.09 wt.% carbon, and about 0.05 to 0.08 wt.% phosphorus and about 0.07 to 0.09 wt.% carbon; and the balance of said alloy being essentially iron.

4,576,642

ALLOY COMPOSITION AND PROCESS

Frederick C. Holtz, Jr., Birmingham, Mich., assignor to Crucible Materials Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 513,058, Oct. 8, 1974, Pat. No. 4,469,514, which is a continuation of Ser. No. 279,942, Aug. 11, 1972, abandoned, which is a continuation of Ser. No. 435,733, Feb. 26, 1965, Pat. No. 3,746,518. This application Jul. 19, 1984, Ser. No. 632,385

The portion of the term of this patent subsequent to Jul. 17, 1990, has been disclaimed.

Int. Cl.[4] C22C *29/02*

U.S. Cl. 75—239 6 Claims

1. A consolidated integral high speed steel alloy body which is essentially fully dense formed of a hot worked supersaturated solid solution of an inherently alloying composition, said alloy body consisting essentially of a continuous metallurgical phase with a uniformly dispersed hard phase of minute dispersed hard phase particle sizes that are essentially entirely less than 3 microns, said alloying composition consisting essentially by weight of from about 0.8% to about 3.4% carbon, at least about 17% of a hard phase-forming element selected from the group consisting of Cr, W, Mo, Ti, Ta, Cb, and V, and mixtures thereof, and the remainder base metal and incidental impurities, wherein said base metal is iron or a mixture of iron and cobalt, and wherein the amount of iron is at least about 35% and the amount of cobalt is 0% to about 27%.

4,576,643

RUST PREVENTIVE AND PROCESS FOR THE PREPARATION THEREOF

Kaj M. Skantz, Nikkilae, and Ari R. E. Christiansen, Espoo, both of Finland, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Jun. 28, 1984, Ser. No. 625,498

Claims priority, application Finland, Jul. 1, 1983, 832428

Int. Cl.[4] C04B *9/02*

U.S. Cl. 106—14.24 7 Claims

1. Rust preventative containing, as a binder agent, a tall oil pitch ester having an acid number between 0 and 15 mg KOH/g wherein the tall oil pitch ester is produced by esterifying tall oil pitch having an acid number between 17 and 50 mg KOH/g with alcohol comprising alcohol derived from unsaponifiable fraction of tall oil.

4,576,644

METHOD OF PRODUCING CEMENT FROM RAW MATERIAL CONTAINING HARMFUL SUBSTANCES

Wolf Goldmann, Beckum, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

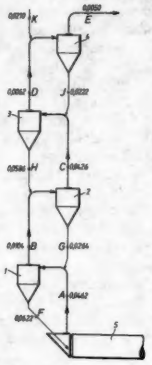
Filed Nov. 14, 1983, Ser. No. 551,677

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244241

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—100 8 Claims

1. In a method of producing cement from raw material containing sulphur, alkali, chlorine or other harmful substance wherein such material is delivered in a stream via a multi-stage cyclone preheater to a kiln separate from said preheater and from which kiln exhaust gas flows in a stream through the preheater countercurrent to such material stream, and wherein a proportion of the material stream or the gas stream is extracted to reduce the circulation of such harmful substance, the improvement comprising extracting from the preheater a sufficient quantity of one of said streams to obtain a selected reduction in the content of said harmful substance, the extraction of said one of said streams occurring at a zone of said preheater



which results in the reduction of the highest quantity of said harmful substance at the least heat loss.

4,576,645

WHIPPED GEL COMPOSITION

Kanak K. R. Ravel, Perth Amboy; Bhupendra R. Vaidya, Kendall Park, and Nelly A. Nerizon, Belleville, all of N.J., assignors to Block Drug Co., Inc., Jersey City, N.J.

Filed Dec. 6, 1984, Ser. No. 678,697

Int. Cl.[4] A01N *31/00;* A61F *13/00;* A23C *11/00;* A61K *9/10*

U.S. Cl. 106—125 23 Claims

1. An edible thixotropic, spoonable soft gel comprising an aerated multiphase composition of emulsified glyceride dispersed in a continuous hydrocolloid phase, said gel having an RVT Brookfield viscosity of about 100,000–500,000 centipoises at room temperature and a TD spindle speed of 2.5 rpm.

4,576,646

FILM-FORMING COMPOSITIONS FOR ENVELOPING SOLID FORMS, PARTICULARLY PHARMACEUTICAL OR FOOD PRODUCTS OR SEEDS, AND PRODUCTS OBTAINED, COATED WITH SAID COMPOSITIONS

Bernard Branco, Le Chesnay, and Michel Malandain, Marly le Roi, both of France, assignors to Seppic, Paris, France

Division of Ser. No. 627,665, Jul. 3, 1984, Pat. No. 4,513,019. This application Oct. 31, 1984, Ser. No. 666,762

Int. Cl.[4] A61K *9/36;* C08L *1/00*

U.S. Cl. 106—163.1 7 Claims

1. Film-forming compositions for enveloping solid forms such as pharmaceutical or food products or seeds, wherein said compositions comprise, by weight:

15 to 85% of a cellulosic film-forming substance,

10 to 70% of at least one alpha-cellulose,

5 to 30% of at least one plasticizer suitable for consumption.

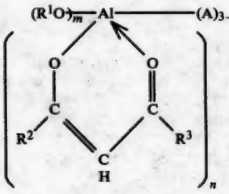
4,576,647

OLEOPHILIC COMPOSITION COMPRISING A POWDERY OR GRANULAR SUBSTANCE HAVING A HYDROPHILIC SURFACE AND AN ALUMINUM CHELATE COMPOUND

Noritaka Matsushita, Takefu, Japan, assignor to Kawaken Fine Chemicals Co., Ltd. and Ajinomoto Co., Inc., both of Tokyo, Japan

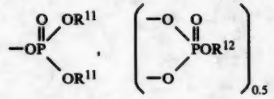
Continuation of Ser. No. 424,452, Sep. 27, 1982. This application Aug. 24, 1984, Ser. No. 629,709
Int. Cl.[4] C04B *14/00*; C07F *5/06*
U.S. Cl. 106—193 R 20 Claims

1. An oleophilic composition comprising a powdery or granular substance having a hydrophilic surface and 0.1% to 20% by weight, based on the weight of said powdery or granular substance, of at least one aluminum chelate compound represented by the following general formula (I):

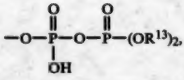


(I)

wherein R^1 is at least one member selected from a hydrogen atom and an alkyl group having 1 to 6 carbon atoms, R^2 is at least one member selected from methyl and phenyl groups, R^3 is at least one member selected from R^4—, R^5O— and R^6NH—, A is at least one member selected from R^7O—, R^8COO—, R^9SO_3—, $R^{10}OSO_3$—,



and



R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} stand for an alkyl group having 1 to 22 carbon atoms or an alkenyl, aryl, aralkyl or alkylaryl group having 3 to 22 carbon atoms, R^3 may be the same as or different from R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13}, with the proviso that at least one of R^3, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} is a substituent having at least 8 carbon atoms or a polymerizable alkenyl group, and m and n are means values per molecule which satisfy the requirements of m=0.5 to 2.7, n=0.3 to 2.5 and m+n=0.8 to 3.

4,576,648

CATIONIC EMULSIONS OF BITUMINOUS BINDERS OF THE BITUMEN TYPE AND THEIR PROCESS OF PREPARATION

Francis Demangeon, Dardilly; Germain Hagenbach, Vernaison, and Paul Maldonado, Saint Symphorien d'Ozon, all of France, assignors to Elf France, Paris, France

Continuation of Ser. No. 637,323, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 445,255, Nov. 29, 1982, abandoned. This application Jun. 7, 1985, Ser. No. 742,635
Claims priority, application France, Nov. 27, 1981, 81 22275
Int. Cl.[4] C08L *5/00, 95/00*
U.S. Cl. 106—269 17 Claims

1. A cationic emulsion of a bituminous binder comprising: a bituminous binder dispersed in an aqueous phase containing a cationic emulsifying agent and an acid, said acid being present in an amount sufficient to provide an aqueous phase having a pH of from 1 to 7, wherein the bituminous binder is at least one member selected from the group consisting of a homogeneous solution of bitumen and at least one polymer, bitumen modified by at least one polymer, bitumen modified by at least one polymer in the presence of a reactive agent, and bitumen modified by at least one polymer in the presence of a reactive agent and an additive, and wherein the acid consists essentially of at least one carboxylic acid selected from the group consisting of C_1 to C_{20} saturated aliphatic monocarboxylic acids, C_2 to C_{20} saturated aliphatic polycarboxylic acids, C_2 to C_{20} unsaturated aliphatic monocarboxylic acids, C_2 to C_{20} unsaturated aliphatic polycarboxylic acids, saturated C_4 to C_{12} alicyclic monocarboxylic acids, saturated C_4 to C_{12} alicyclic polycarboxylic acids, unsaturated C_4 to C_{12} alicyclic monocarboxylic acids, unsaturated C_4 to C_{12} alicyclic polycarboxylic acids, C_7 to C_{12} aromatic monocarboxylic acids, C_7 to C_{12} aromatic polycarboxylic acids and hydroxyl derivatives of said acids.

4,576,649

COLOR ENHANCED PERMANENT PIGMENTS FROM PRECIPITATED CATIONIC DYES

Vincent S. Oliver, West Orange; Walter Tames, Hillside; Helmuth H. Prochaska, and Karl-Heinz Wieser, both of Wayne, all of N.J., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1984, Ser. No. 666,947
Int. Cl.[4] C09C *3/00*
U.S. Cl. 106—308 Q 24 Claims

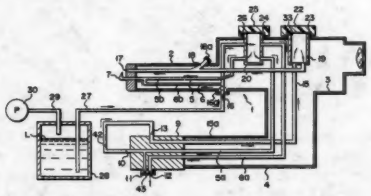
1. A pigment composition comprising a cationic dye selected from the group consisting of
Color Index Basic Red 12
Color Index Basic Red 28
Color Index Basic Red 14
Color Index Basic Violet 10
which has been precipitated from aqueous solution by reaction with a complex heteropoly acid in the presence of a color enhancing agent selected from the group consisting of quaternary ammonium salts and ammonium salts of amines derived from abietic acid or natural or synthetic derivatives of abietic acid.

4,576,650

METHOD OF CLEANING ENDOSCOPE CHANNELS

Hisao Yabe; Hiroyuki Sasa; Yukio Nakajima; Fumiaki Ishii; Koji Takamura, and Takeaki Nakamura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,575
Claims priority, application Japan, Apr. 22, 1983, 58-71204; Apr. 22, 1983, 58-71205; Apr. 25, 1983, 58-72522; May 2, 1983, 58-77897
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] B08B *3/04, 9/00*
U.S. Cl. 134—22.12 3 Claims



1. A method of cleaning an endoscope; said endoscope including a control section, an insertion section extending from the control section and having a nozzle at a distal end thereof,

a light guide cable extending from the control section and having a connector at a distal end thereof, an air supply channel extending in the endoscope and having one end communicating with the nozzle and another end opening into the connector, a liquid supply channel extending in the endoscope and having one end communicating with the nozzle and another end opening into the connector, a suction channel extending in the endoscope and having one end opening to the distal end of the insertion section and another end opening into the connector, an air/liquid supply valve cylinder arranged in the control section to communicate with the air supply channel and liquid supply channel and having one end opening to the outside of the control section, a suction valve cylinder arranged in the control section to communicate with the suction channel and having one end opening to the outside of the control section, and a sub-liquid supply port communicating with the liquid supply channel; said method comprising the steps of:

closing said open ends of the air/liquid supply valve cylinder and the suction valve cylinder;

connecting said other ends of the air supply channel and the suction channel to each other through connecting means; and

supplying liquid to the sub-liquid supply port and discharging the liquid from the nozzle, said other end of the liquid supply channel and said one end of the suction channel through the three channels, the valve cylinders and the connecting means, thereby cleaning the interior of these channels and the valve cylinders with the liquid.

4,576,651

TREATMENT OF SCRAP LINING MATERIAL FROM ALUMINIUM REDUCTION CELLS

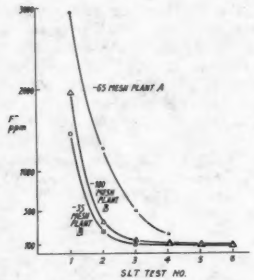
John E. Deutschman, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Feb. 28, 1984, Ser. No. 584,534

Claims priority, application United Kingdom, Mar. 1, 1983, 8305583

Int. Cl.[4] B08B *3/08, 7/04*

U.S. Cl. 134—25.1 **8 Claims**



1. A process for treating fluoride-contaminated scrap lining material from electrolytic reduction cells which consists essentially of mixing the lining material with at least 7 parts sulphuric acid by weight per 100 parts scrap lining material to produce a slurry, mixing into said slurry an amount of lime in amount at least sufficient to completely neutralise the sulphuric acid, but insufficient to raise pH of said slurry above 10, said slurry having a total liquid content sufficient to bring it to a paste-like consistency, the slurry then being allowed to set into a solid mass bound by hydrated calcium sulphate.

4,576,652

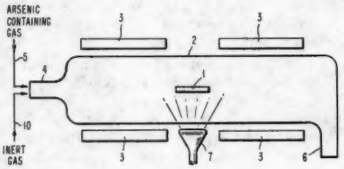
INCOHERENT LIGHT ANNEALING OF GALLIUM ARSENIDE SUBSTRATE

Harold J. Hovel, Katonah, and Thomas F. Kuech, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,057

Int. Cl.[4] H01L *21/263*

U.S. Cl. 148—1.5 **19 Claims**



1. A process for annealing an ion implanted gallium arsenide substrate which comprises maintaining said gallium arsenide substrate on all sides above about 400° C. in an arsenic-containing gaseous ambient on all sides of said substrate;

heating said gallium arsenide substrate with broad area incoherent light for a time sufficient for annealing said ion implanted gallium arsenide substrate.

4,576,653

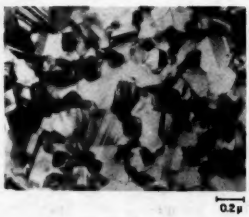
METHOD OF MAKING COMPLEX BORIDE PARTICLE CONTAINING ALLOYS

Ranjan Ray, Randolph, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 549,025, Nov. 7, 1983, abandoned, which is a division of Ser. No. 371,758, Apr. 26, 1982, Pat. No. 4,439,236, which is a division of Ser. No. 23,378, Mar. 23, 1979, Pat. No. 4,365,994. This application Apr. 3, 1985, Ser. No. 718,208

Int. Cl.[4] C22C *1/10, 33/00*

U.S. Cl. 148—3 **3 Claims**



1. A method for making boron-containing transition metal alloys, based on one or more of iron, cobalt and nickel, containing at least two metal components, comprising the steps of:

a. rapidly quenching alloys having composition of the formula:

$$R_uR'_vCr_wM_xB_y(P, C, Si)_z \quad (A)$$

wherein

R is one of iron, cobalt or nickel;

R′ is one or two of iron, cobalt or nickel other than R;

Cr, B, P, C and Si respectively represent chromium, boron, phosphorus, carbon and silicon;

M is one or more of molybdenum, tungsten, vanadium, niobium, titanium, tantalum, aluminum, tin, germanium, antimony, beryllium, zirconium, manganese and copper;

u, v, w, x t and z represent atom percent of R, R′, Cr, M,

B and (P, C, Si), respectively, and have the following values:

u=30–85
v=0–30
w=0–45
x=0–30
y=5–12
z=0–7.5

with the provisos that (1) the sum of v+w+x is at least 5; (2) when x is larger than 20, then w must be less than 20; and (3) the amount of each of vanadium, manganese, copper, tin, germanium, antimony and magnesium may not exceed 10 atom percent, to form an amorphous alloy having the aforestated formula (A), said amorphous alloy being at least about 50 percent amorphous, as determined by X-ray diffractometry; and

b. heating said amorphous alloy to temperature between about, 0.7 and about 0.8 of the solidus temperature of said alloy in degrees centigrade for a time period of about 1 to about 20 hours, to effect devitrification of said alloy, so that, upon devitrification, said alloy is composed of ultrafine grains of a primary solid solution phase randomly interspersed with particles of complex borides, wherein said complex boride particles are predominantly located at the junctions of at least three grains of said ultrafine grain solid solution phase.

4,576,654

HEAT TREATED TUBE

Fletcher C. Eddens; David W. White, and John L. Harmon, all of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 368,715, Apr. 15, 1982, abandoned. This application Nov. 1, 1982, Ser. No. 438,515

Int. Cl.[4] C22F 1/18

U.S. Cl. 148—11.5 F **40 Claims**

1. A process for producing a zirconuim alloy tube having a metallurgical gradient having a less corrosion-resistant metallurgical condition at the inner circumference of the tube and a more corrosion-resistant metallurgical condition at the outer circumference of the tube comprising:

forming a zirconium alloy tube having said less corrosion-resistant metallurgical condition;

heating an outer circumferential portion of the tube to the high alpha range, or mixed alpha plus beta range for a time sufficient to transform the outer circumferential portion of the tube to said more corrosion-resistant metallurgical condition while cooling to maintain the inner circumferential portion of the tube at a temperature sufficiently low that essentially no metallurgical change occurs at the inner surface;

cooling the tube sufficiently rapidly to retain said more corrosion-resistant metallurgical condition at the outer circumference portion; and

reducing the diameter of the thus heat treated tube with multiple cold working reduction passes in a reduction mill.

4,576,655

METHOD FOR PRODUCING HIGH STRENGTH STEEL WITH GOOD DUCTHLITY

Erik A. A. Josefsson, Borlänge, Sweden, assignor to SSAB Svenskt Stal AB, Stockholm, Sweden

Continuation of Ser. No. 621,457, Jun. 18, 1984, abandoned. This application Aug. 27, 1985, Ser. No. 769,807

Claims priority, application Sweden, Jun. 23, 1983, 8303606

Int. Cl.[4] C21D 7/14

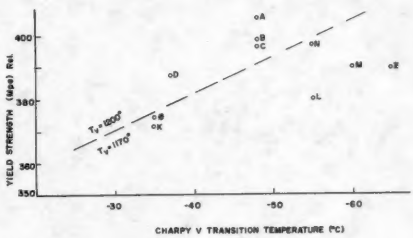
U.S. Cl. 148—12 F **5 Claims**

1. A process for manufacturing hot rolled steel products having a high strength and good ductility as hot rolled, said method comprising

(a) producing a low-alloy steel having a carbon content within the range of about 0.02 to 0.15 wt %, a niobium content within the range of about 0.015 to 0.100 wt %, and a titanium content within the range of about 0.005 to 0.040 wt %,

(b) heating said low-alloy steel of step (a) to a temperature between about 1150° and 1250° C.,

(c) subjecting said low-alloy steel produced in step (b) to a first rolling sequence which includes at least one rolling pass, one rolling pass of said first rolling sequence being a final rolling pass, such that said low-alloy steel has a an average austenite grain size therein of less than 50 μm and such that said low-alloy steel, after said final rolling pas, has a temperature of between about 950° and 1100° C.,



(d) subjecting said low-alloy steel produced in step (c) to a second rolling sequence which includes at least one rolling pass, each said rolling pass in said second rolling sequence being conducted at a temperature between about 900° and 1100° C. and one of said rolling passes being conducted at a temperature between about 950° C. and 1100° C., each said rolling pass producing an area reduction in said low-alloy steel of less than 15%, the total area reduction of said low-alloy steel in said second rolling sequence being less than about 39%, and

(e) cooling the low-alloy steel produced in step (d).

4,576,656

METHOD OF PRODUCING COLD ROLLED STEEL SHEETS FOR DEEP DRAWING

Susumu Satoh; Takashi Obara, and Minoru Nishida, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP83/00334, § 371 Date Mar. 15, 1984, § 102(e) Date Mar. 15, 1984, PCT Pub. No. WO84/01585, PCT Pub. Date Apr. 26, 1984

Continuation of Ser. No. 596,451, Mar. 15, 1984, abandoned. This PCT application Oct. 7, 1983, Ser. No. 768,927

Claims priority, application Japan, Oct. 8, 1982, 57-177046

Int. Cl.[4] C21D 9/48

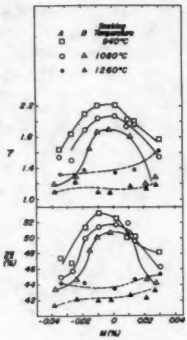
U.S. Cl. 148—12 C **3 Claims**

1. A method of producing cold rolled steel sheets for deep drawing, comprising soaking at a temperature lower than 1,100° C. a steel slab having a composition consisting of, in % by weight, not more than 0.015% of C, not more than 0.40% of Mn, not more than 0.03% of P, 0.005–0.100% of sol. Al, not more than 0.010% of N, Ti in an amount within the range satisfying the following formula

$$-0.020\% \leq \mathrm{Ti} - \left(\frac{48}{32}\mathrm{S} + \frac{48}{14}\mathrm{N}\right) < 0.004\%$$

provided that the Ti in the formula does not include Ti present in the slab in the form of oxide, and the remainder being Fe and incidental impurities; finishing a hot rolling of the soaked slab at a temperature of 600°–780° C.; cold rolling the hot rolled sheet; and annealing the cold rolled sheet, so as to produce a

cold rolled steel sheet having an elongation higher than 51%, and a r-value higher than 1.6.

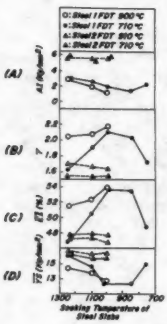


4,576,657

PROCESS OF MANUFACTURING A COLD ROLLED STEEL SHEET HAVING EXCELLENT PRESS FORMABILITY

Susumu Satoh, Chiba; Osamu Hashimoto, Kurashiki, and Toshio Irie, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP83/00050, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/02957, PCT Pub. Date Sep. 1, 1983
Continuation of Ser. No. 545,396, Oct. 13, 1983, abandoned.
This PCT application Feb. 18, 1983, Ser. No. 765,557
Claims priority, application Japan, Feb. 19, 1982, 57-25567
Int. Cl.[4] C21D 9/48
U.S. Cl. 148—12 C 4 Claims



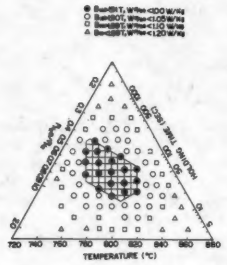
1. A process of manufacturing a cold rolled steel sheet having excellent press-formability, which comprises soaking a steel slab consisting of not more than 0.005% by weight of C, not more than 1.20% by weight of Si, 0.05–1.00% by weight of Mn, not more than 0.150% by weight of P, at least one element selected from the group consisting of Nb, Cr, Ti, Al, B, and W in a total amount of 0.002–0.150% by weight, and the balance being Fe and incidental impurities at a temperature range of 800°–1,080° C., followed by a hot rolling, a cold rolling, and a recrystallization annealing consecutively, whereby the resulting cold rolled steel sheet has an elongation of over 50% and an $\bar{r}$ value $\geqq 1.8$.

4,576,658

METHOD FOR MANUFACTURING GRAIN-ORIENTED SILICON STEEL SHEET

Yukio Inokuti, 664-25, Hagidai-cho, Chiba, Japan 260; Yasuhiro Kobayashi, 1876, Tantakabayashi, Higashi-Nada-ku, Kobe-shi, Japan 658, and Yo Ito, 500-1, Kawata-cho, Chiba, Japan 280

Filed Nov. 30, 1984, Ser. No. 677,675
Claims priority, application Japan, Dec. 2, 1983, 58-228174
Int. Cl.[3] H01F 1/04
U.S. Cl. 148—111 2 Claims



1. A method of manufacturing grain-oriented silicon steel sheet comprising the successive steps of:

hot-rolling silicon steel material containing 0.01 to 0.06 wt % carbon, 2.0 to 4.0 wt % silicon, 0.01 to 0.2 wt % manganese, and a total of 0.005 to 0.1 wt % of sulfur and/or selenium;

setting the final sheet thickness by cold rolling once, or cold rolling two or more times, while interspersing an intermediate annealing step between each cold rolling step;

decarburization and primary recrystallization annealing; and

final finish annealing to induce the growth of secondary recrystallization grains having a {110}<001> orientation, wherein said decarburization and primary recrystallization annealing process comprises rapid-heating in the temperature range of 400° C. to 750° C. at an average temperature rise rate of at least 10° C./sec, annealing for 50 seconds to 10 minutes within a temperature range of 780° to 820° C. in an oxidizing atmosphere having a ratio of the partial pressure of H_2O to the partial pressure of H_2, P_{H2O}/P_{H2}, of from 0.4 to 0.7, then annealing for 10 seconds to 5 minutes within a temperature range of 830° to 870° C. in an oxidizing atmosphere for which the ratio in partial pressures P_{H2O}/P_{H2} ranges from 0.08 to 0.4.

2. A process for manufacturing grain-oriented silicon steel sheet comprising the successive steps of:

hot-rolling silicon steel containing 0.01 to 0.06 wt % carbon, 2.0 to 4.0 wt % silicon, 0.01 to 0.2 wt % manganese, a total of 0.005 to 0.1 wt % of sulfur and/or selenium, and also 0.005 to 0.1 wt % of molybdenum and/or 0.005 to 0.2 wt % of antimony;

setting the final sheet thickness by cold rolling once, or cold rolling two or more times, while interspersing an intermediate annealing step between each cold rolling step;

decarburization and primary recrystallization annealing; and

final finish annealing to induce the growth of secondary recrystallization grains with a {110}<001> orientation, wherein said decarburization and primary recrystallization annealing process comprises rapid-heating in the temperature range of 400° C. to 750° C. at an average temperature rise rate of at least 10° C./sec, annealing for 50 seconds to 10 minutes within a temperature range of 780° to 820° C. in an oxidizing atmosphere having a ratio of the partial pressure of H_2O to the partial pressure of H_2, P_{H2O}/P_{H2}, of from 0.4 to 0.7, then annealing for 10 seconds to 5 minutes within a temperature range of 830° to 870° C. in an oxidizing atmo-

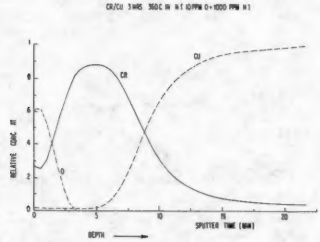
sphere for which the ratio in partial pressures P_{H2O}/P_{H2} ranges from 0.08 to 0.4.

4,576,659

PROCESS FOR INHIBITING METAL MIGRATION DURING HEAT CYCLING OF MULTILAYER THIN METAL FILM STRUCTURES

Robert K. Lewis, and Sudipta K. Ray, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,300
Int. Cl.[4] B23K *31/02*; C21D *1/74*
U.S. Cl. 148—127 10 Claims



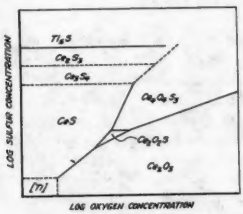
1. A process for inhibiting the diffusion of metal from a metal underlayer through a thin metal overlayer when the two layers, while in contact, are heated in the temperature range of 200°–400° C., comprising conducting said heating in the presence of an ambient gas mixture comprising an inert gas and an amount of active gas sufficient substantially to prevent metal from the underlayer from diffusing through to the surface of the thin metal overlayer and onto the surface of the metal overlayer during said heating, wherein said active gas is hydrogen and is present in the mixture in a concentration of from about 0.1% up to less than 4%, wherein the thickness of the overlayer is in the range of 500 to 2,000 Å and the underlayer has a thickness of from 50,000 to 100,000 Å, wherein the underlayer and overlayer combinations are selected from the group consisting of copper coated with cobalt, copper coated with chromium and copper coated with titanium.

4,576,660

OXYSULFIDE DISPERSION STRENGTHENED TITANIUM COMPOSITIONS

Raymond G. Rowe, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1985, Ser. No. 702,204
Int. Cl.[4] C22C *14/00*, *1/18*
U.S. Cl. 148—407 7 Claims



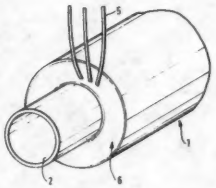
3. A titanium base composition having distributed therein a fine dispersoid of a metal compound of high chemical stability, said compound being formed of at least one metal and at least one nonmetal,
said nonmetal being oxysulfide,
said metal being selected from the group consisting of calcium, cerium, gadolinium, praesodynium, lanthanum, yttrium and strontium.

4,576,661

PROCESS FOR SEALING THE END OF INSULATED PIPES WHICH HAVE A NUMBER OF MONITORING WIRES, AND MEANS FOR CARRYING OUT THE PROCESS

Thomas B. Persson, Västra Söbacken 27, 444 00 Stenungsund, Sweden

Filed Apr. 12, 1984, Ser. No. 599,519
Claims priority, application Sweden, May 26, 1983, 8302960
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—48 8 Claims



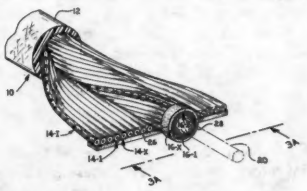
1. A process for sealing the end of insulated pipes in the nature of hot pipes, which have a number of monitoring wires extending between an inner fluid-transporting pipe and a casing which surrounds insulation, out past the insulation on the insulating pipe, characterized in that a sealing material which withstands working temperatures on the pipes of up to approximately 120° C. and which contains a mixture of wax and bitumen, in a flowing state and heated to an appropriate temperature, is applied over the end of the pipe and around the monitoring wires at the region of said pipe ends in a manner that the sealing material when it sets adheres to the pipe ends alongside the insulation of the pipe and monitoring wires which project out from the pipe end, so that a liquid-impermeable layer is formed between the edges of the casing and the fluid-transporting pipe, connecting them together and providing an enclosing seal with smooth transitions at the respective monitoring wires.

4,576,662

PROCESS FOR LOCATING AND CONNECTING INDIVIDUAL CONDUCTORS IN A MULTI-LAYER CONCENTRIC LAY CABLE

Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 5, 1984, Ser. No. 668,423
Int. Cl.[4] H01B *13/00*
U.S. Cl. 156—52 20 Claims



9. A process for ordering the individual conductors in each layer of a concentric lay multi-layered cable wherein one of

the conductors in each layer has a predetermined indicia thereon comprising the steps of:

(a) joining each of the conductors in one of the concentric layers of conductors;

(b) separating the conjoined conductors along a predetermined path as defined by reference to the predetermined indicia in the layer; and

(c) repeating steps (a) and (b) for each remaining layer of conductors in the cable.

4,576,663

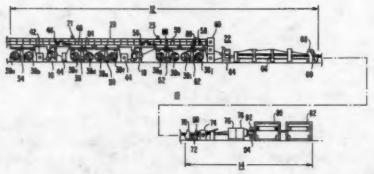
ORDER CHANGE METHOD AND APPARATUS FOR CORRUGATOR MACHINE

William H. Bory, Baltimore, Md., assignor to Chesapeake Corporation, West Point, Va.

Filed Aug. 31, 1984, Ser. No. 646,247

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—64 **23 Claims**



1. Apparatus for changing the output material of a corrugator machine having a first and second single facers, each single facer including first and second splicers supplying single ply web material, a double backer producing composite web material and having a splicer supplying single ply web material, and a shear, the output material being changed from a first order material to a second order material, said apparatus comprising:

a first signal generator producing a first feedlength signal proportional to the length of single ply web material supplied by the first splicer of the first single facer;

a second signal generator producing a second feedlength signal proportional to the length of single ply web material supplied by the first splicer of the second single facer;

a third signal generator producing a third feedlength signal proportional to the length of single ply web material supplied by the double backer splicer;

a memory device for storing a plurality of position values which are functions of the relative locations of the first and second splicers of the first and second single facers, and a plurality of inventory values which are functions of the relative locations of the first and second single facers, the double backer, and the shear, said inventory values also being functions of the differences between said first, second, and third feedlength signals; and

control means for generating said inventory values, for comparing said position values with said feedlength signals, for comparing said inventory values, and for generating control signals to sequentially operate the splicers and the shear when the differences between said feedlength signals and said position values and between said stored inventory values reach predetermined values,

whereby splices in single ply web materials of the composite web material output of the double backer and a severance in the composite web material separating the first and second orders are formed in substantial coincidence.

4,576,664

FIXING ARTICLE HOLDERS TO SURFACES

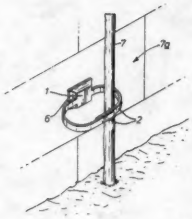
Michael D. Delahunty, Dublin, Ireland, assignor to Ducata Limited, Dublin, Ireland

Filed Dec. 27, 1983, Ser. No. 565,613

Claims priority, application Ireland, Jan. 3, 1983, 5/83; May 17, 1983, 1143/83

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—71 **10 Claims**



9. A method of supporting an element against a hard surface which comprises the steps of:

(i) Mixing a portion of a filled hardenable adhesive composition of putty consistency including an adhesive component and a hardener component which are separately present in the composition in predetermined proportions, so as to form a pellet of the composition in which a hardening reaction has been activated,

(ii) Pressing the pellet into a socket defined by a cup portion in a holding member, said socket having an opening with a cross-sectional area which is less than the cross-sectional area of the interior of the socket,

(iii) Pressing the pellet with the holding member onto a surface at the desired position,

(iv) Allowing a sufficient period of time to elapse for the pellet to harden,

(v) Positioning an element adjacent the holding member and securing it thereto to support the element against or adjacent to the surface.

4,576,665

METHOD FOR MAKING A HOT MELT ADHESIVE BONDED PILE FABRIC

Greville Machell, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

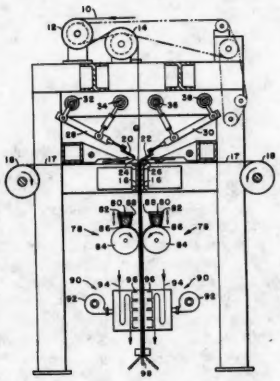
Continuation of Ser. No. 436,230, Oct. 25, 1982, abandoned, which is a division of Ser. No. 304,486, Sep. 22, 1981, Pat. No. 4,371,576. This application Apr. 13, 1984, Ser. No. 599,832

Int. Cl.[4] D04H *11/08*

U.S. Cl. 156—72 **1 Claim**

1. A method for making a hot melt adhesive bonded pile fabric which comprises: positioning two continuous, liquid-permeable base layers in a passage where they lie in substantial parallel relationship to one another at a predetermined distance from one another; driving at least one continuous pile forming yarn by folder blades alternatively against the opposing surfaces of said base layers when they are at or near the entrance to the above mentioned passage in such a way as to position the pile forming yarn relative to the base layers and to fold it zig-zag without tufting said pile-forming yarns through said base layers; thereafter applying to the back of said base layers a hot melt adhesive; forcing said hot melt adhesive through said base layers so that said hot melt adhesive contacts said pile

forming yarn; cooling said hot melt adhesive to a temperature below its softening point to thereby bond said pile forming yarn to said base layers; and cutting said pile forming yarns to form two continuous hot melt adhesive bonded products.



4,576,666

HEAT-RECOVERABLE ARTICLE

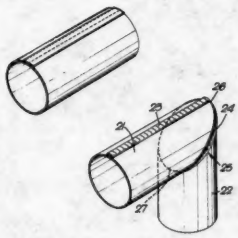
Richard J. Harris; Kenneth B. Pithouse, both of Wiltshire, England, and Frans S. J. Van Dijck, Kessel-Lo, Belgium, assignors to Raychem Limited, Swindon, England

Filed Aug. 14, 1984, Ser. No. 640,723

Claims priority, application United Kingdom, Aug. 16, 1983, 8322004

Int. Cl.[4] B21F *15/06;* B29C *27/20;* B32B *1/08, 1/10*

U.S. Cl. 156—85 19 Claims



1. An article comprising two areas of woven fabric, at least one of which being heat-recoverable, joined together along a line by means of a mechanical joining arrangement that penetrates at least one of the areas of fabric, said area of fabric penetrated having a direction of crimp that is substantially perpendicular to the line at least along part of the length of the line.

16. An article according to claim 1, when installed around a pipe, a cable, a joint in a pipe or a splice in a cable, a bus bar or a joint in a bus bar.

17. A method encapsulating a substrate which comprises recovering into engagement with the substrate an article according to claim 1.

4,576,667

PROCESS FOR PREPARING A SINTERED CERAMIC ARTICLE WITH POROUS REGION

Dale F. Taylor, Schenectady, and Louis S. Sammler, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 451,501, Dec. 20, 1982, Pat. No. 4,560,413. This application Oct. 1, 1984, Ser. No. 656,566

Int. Cl.[4] C03B *29/00*

U.S. Cl. 156—89 3 Claims

1. A process for the manufacture of a sintered metallic oxide article comprising a non-porous body having a cylindrically shaped hole and a close-fitting, non-porous plug at one end of said shaped hole and at least one porous region in the general shape of a hollow cylinder intermediate said cylindrically shaped hole and said plug, said process comprising the steps of:

(a) providing a metallic oxide body prefired at about 1250° C. for about one hour in air in a preselected shape having juxtaposed surfaces,

(b) providing a cylindrically-shaped hole through said body connecting said surfaces,

(c) introducing a close-fitting plug of metallic oxide prefired at about 1250° C. for about one hour in air into said hole to produce an assembly, and

(d) sintering said assembly in a hydrogen atmosphere at about 1900° C. to render said body and said plug non-porous and to form a microporous junction therebetween in the general shape of a hollow cylinder.

4,576,668

PROCESS OF FORMING A LABELED TAG FOR A GARMENT

Susan E. Farrelly, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed May 29, 1984, Ser. No. 614,832

Int. Cl.[4] B32B *31/20, 7/08*

U.S. Cl. 156—93 2 Claims

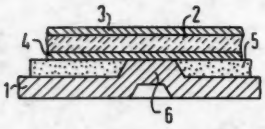
1. A process of forming a labeled tag for a garment comprising the following steps:

(a) sewing a tag having a heat activated bonding agent thereon along one side into an inside seam of said garment with said heat activated bonding agent facing outwards;

(b) placing a label over said tag;

(c) placing jaws of a heating activating press tool over said tag and said label; wherein one of said jaws has a depres-

sion to receive said tag, label and the other of said jaws; and



(d) squeezing said jaws of said heat activating press tool so that said tag and said label will bond together within said depression to form said labeled tag.

4,576,669

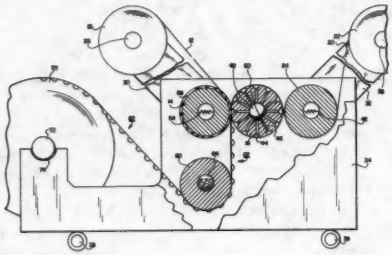
"ON DEMAND" APPARATUS AND METHOD FOR PRODUCING AIR-CUSHIONING PRODUCT

Garry L. Caputo, 464 Riverside Ave., Rutherford, N.J. 07070

Filed Nov. 9, 1984, Ser. No. 669,684

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—145 **18 Claims**



13. A method for producing air-cushioning material for end users' consumption in their own facilities, said material being from two rolls of thermoplastic material such as polyethylene or the like which may be combined with other plastic materials to provide air passage-inhibiting properties, said method providing means for a start and stop of the apparatus by the operator and without alteration of the produced product by said starting and stopping of the apparatus for an "on demand" manufacture and supplying of air-cushioning material to said facility, said method including the steps of:

(a) providing a first roll of thin, thermoplastic film having thermoforming properties when heat-softened;

(b) carrying said roll on a supported shaft and as a continuous strip of film and replacing said roll on said shaft when replenishing the film on the first roll is desired or required;

(c) rotating and driving a first heat-conductive roller to and carrying on said roller the strip of first film around which the wrap extent is at least one hundred fify degrees of arc;

(d) electrically heating said first film on said first heat-conducting roll to a temperature between two hundred and two hundred sixty degrees F. and with a thermostatic control of said first heat-conductive roller whereby and whereon the first film is heat-softened to a thermoforming condition;

(e) rotating a cooled, driven forming roller adjacent to and spacing said forming roller from the first heat-conducting roller so that non-contact is maintained with said first heat-conducting roller and providing between said first roller and said forming roller an S-path of heat-softened first film, said forming roller having its outer peripheral surface with a controlled temperature and formed with a multiplicity of shaped cavities, and providing each cavity at its inner extent a small conductor leading to a conductor connected to a source of vacuum;

(f) carrying valve means in association with a conductor to said source of vacuum, and providing with this valve means a mask, of a determined extent or sector therewith, and opening of about one-half of the small conductors from the shaped cavities to a source of vacuum so that the heat-softened first film when coming in contiguous contact with those cavities connected to said source of vacuum is drawn by vacuum into these shaped cavities forming shaped cell forms, this forming roller cooling the now-formed first film while rotatably and tightly carrying this first film by vacuum on said driven forming roller;

(g) providing a second roll of thin, thermoplastic film as a lidding cover for the air-cushioning material;

(h) driving a thermoconductive pressure roller and heating said roller to a selected temperature by electrical energy and providing on this roll a resilient, thermoconductive cover or outer layer on said pressure roller, said cover having sufficient resiliency and thermal conductivity so that with a wrap of less than ninety degrees of arc, said second lidding film is heated to a welding condition, and with the second film in a wrap condition on said pressure roller, said heat is sufficient that the peripheral temperature of the roller brings the second film to a temperature of at least two hundred seventy degrees F. and while the first thermoformed and heated film is brought in way of this second heated, lidding film, pressing these films together into a welded condition, the cover on this pressure roller sufficiently resilient so that with a minimum of applied pressure the second heated film is pressed to and into the first thermoformed film so that at the peripheral interstices between shaped cavities and at the outer surface of the forming roller the welding is achieved, the peripheral speed of the driven pressure roller and the forming roller substantially in coincidence, the welding of the two plies of film material providing in the thermoformed air-cushioning material a multiplicity of air-encased cells, and moving the pressure roll toward and away from the forming roll and adjustably applying such pressure and maintaining said pressure to accommodate the type and thickness of the films being welded;

(i) thermostatically controlling the electrical heating of said drive thermoconductive pressure roll to maintain the temperature in said lidding material provided by this second film where and when the wrap of film is on said roll;

(j) cooling a chill roll and positioning said roll so as to receive the welded strip of material and engaging said welded air-cushioning strip on the outer surface of said material, this cooling sufficient to bring the welded air-cushioning material to a temperature that is at or near room temperature, and

(k) carrying said cooled air-cushioning material to accumulation means such as a storage roll or a packing table.

4,576,670

METHOD FOR MAKING CONTACT WITH THE ELECTRODE ON THE ADHESIVE-COATED SIDE OF AN ELECTRICAL COMPONENT AND THE ARTICLE MADE BY SUCH METHOD

Reinhart Schade, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 33,727, Apr. 26, 1979, abandoned. This application Oct. 21, 1980, Ser. No. 199,387

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820403

Int. Cl.[4] B32B *31/00*

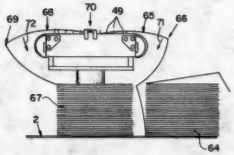
U.S. Cl. 156—219 **6 Claims**

1. A method of making contact with an electrode of an

electrical component which is bonded by an insulating adhesive layer to an electrically conductive carrier plate, comprising the steps of:

applying an insulating adhesive layer to the carrier plate;

prior to bonding, providing a contact element in the area of the adhesive layer by embossing the carrier plate a distance greater than the thickness of the adhesive layer so



that the embossment constitutes the contact element and contact is made between the carrier plate and the electrode during bonding; and

applying heat and pressure to the component and the carrier plate to cause the adhesive material to be displaced by the contact element and bond the carrier plate, the contact element and the electrode.

4,576,671

METHOD OF MANUFACTURING ALATE MEDICAL NEEDLE

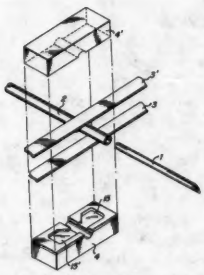
Hirotaka Shimanaka, 3-8-19, Sakurao, Hatsukaichi-cho, Saekigun, Hiroshima-pref., Japan

Filed Jun. 29, 1984, Ser. No. 626,612

Claims priority, application Japan, Jul. 6, 1983, 58-123646; Oct. 31, 1983, 58-205571; Oct. 31, 1983, 58-205572

Int. Cl.⁴ B29C *65/04*

U.S. Cl. 156—245 **3 Claims**



1. A method of manufacturing an alate needle comprising a needle, wings, and a tube, which method comprises

inserting a base portion of a needle into a thermoplastic resin tube,

placing the inserted portion of said tube and one or two sheets of thermoplastic resin into a wing-forming mold, the tube being positioned so that the base portion of the needle lies outward of a side surface of the mold, and

heating the thermoplastic resin by using the mold and the needle as electrodes and passing a high-frequency current there through,

thereby simultaneously bonding the needle and tube together and forming wings which are integral with said tube.

4,576,672

APPARATUS FOR THE PRODUCTION OF REINFORCING NON-WOVEN FABRICS FOR COMPOSITES

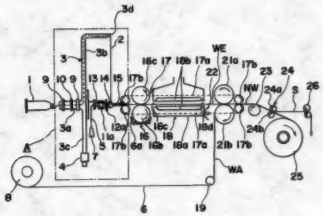
Hiroyasu Kobayashi, Suita; Masayuki Fukui, Nishinomiya, and Shosaku Nomoto, Kobe, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Apr. 7, 1983, Ser. No. 482,975

Claims priority, application Japan, Apr. 12, 1982, 57-61280

Int. Cl.⁴ D04H *3/02*

U.S. Cl. 156—177 **7 Claims**



1. A process for producing non-woven fabric reinforcement for composite material, comprising:

continuously supplying a pair of selvage threads in horizontally spaced parallel relationship;

laying down a continuous weft thread in a succession of spaced transverse reaches joined by selvage loops around the pair of selvage threads to form a weft sheet;

nipping the selvage loops and selvage threads on both sides of said weft sheet and for conveying said weft sheet in a horizontal plane while tensioning the weft thread reaches laterally of the weft sheet;

applying thermoplastic adhesive to the portions of the weft threads other than the selvage loops on only the portions of the weft threads facing outwardly of said weft sheet on at least one side of said thread as said weft sheet is being conveyed by means positioned along said nipping and conveying means;

drying and melting the adhesive on the weft threads by heating means positioned along said nipping and conveying means downstream of said adhesive applying means;

continuously supplying a warp sheet to said at least one side of said weft sheet at a position downstream of said heating means;

preheating the warp threads of said warp sheet immediately before their arrival at the weft sheet to a temperature sufficient for adhesion to the thermoplastic adhesive on the weft threads by means adjacent the point at which said warp sheet is supplied to said weft sheet;

continuously pressing the weft and warp sheets together for bonding the weft and warp threads of the respective sheets at the points of intersection thereof to form the non-woven fabric, the pressing including controlling the temperature of the surfaces of the pressing on the warp and weft sheets being at a temperature lower than the softening point of the adhesive; and

winding the non-woven fabric into a roll.

4,576,673

SERVICE UNIT INTENDED TO CONTINUOUSLY SUPPLY A HIGH-SPEED PRINTER WITH PREFORMED SUPPORT PACKAGES

Mauro Lenzi, Via G. Paganino, 2, 56100 Pisa, Italy

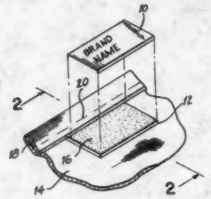
Filed Jul. 19, 1984, Ser. No. 632,587

Int. Cl.⁴ B31F *5/00*

U.S. Cl. 156—350 **8 Claims**

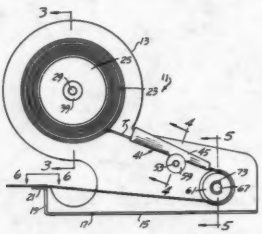
1. A service unit for continuously supplying a high-speed printer with a preformed paper support in folded packages, which unit has a long working autonomy without requiring the

intervention of an operator, said unit comprising in combination: a support frame, a package backing plane comprising a conveyor belt controlled by a microprocessor having a sensor for placing in position each packaging to be supplied to said printer; and, a plane for joining the paper support packages, said joining plane being able to move along a plane parallel to said package backing plane and placed above said package backing plane at such a height that said packages cannot be touched thereby, thus allowing the ends of the packages placed side by side to continuously connected to each other by an adhesive tape, wherein said joining plane comprises a plurality of completely retractile reference and blocking pins intended



to place and maintain in position said ends to be joined; a filling assembly for the central joining area; and, an assembly for automatically cutting said adhesive tape, and wherein said joining plane also comprises: an assembly for supporting the adhesive tape roll; a transmission means; a guiding and a reference means; a friction assembly acting directly on said adhesive tape and not on said roll in order to stretch, place in position and stick said tape on said paper support to be joined; a driving means and pneumatic assemblies for operating said members and/or support, transport and moving assemblies; and, an electronic unit for controlling the synchronized and selective operation of said means, members and assemblies.

4,576,674
MASKING TAPE DISPENSER
Walter Le Tarte, P.O. Box 68, Smiths Creek, Mich. 48074
Filed Jun. 18, 1984, Ser. No. 621,545
Int. Cl.⁴ B31F *1/00*
U.S. Cl. 156—463 **6 Claims**



1. An edge blending masking tape dispenser comprising an upright roll support plate having a right angular apertured base plate mountable upon a support and having at one end an elevated serrated tape tear off edge;

an upright roll of adhesive coated masking tape journaled and yieldably retained upon said support plate above said base plate;

a tape edge folding and forming die assembly spaced from said tape roll mounted upon said support plate and having a channel of less width than the tape;

the free end of the tape extending to and around said forming die assembly to and over said tear-off edge for longitudinal manual feeding thereof;

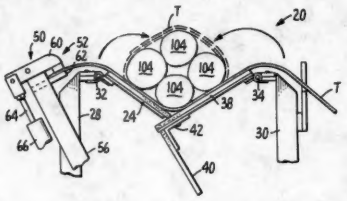
said die assembly elevating one longitudinal edge of the tape and folding said edge down onto the tape as it passes around said die assembly, automatically forming downstream of said die assembly a folded down non-stick strip along one edge of said tape;

said die assembly including a tape edge folding and forming roll journaled upon said support plate and having an annular channel of less width than the tape;

the free end of the tape extending to and around said forming roll;

said roll elevating one longitudinal edge of the tape and folding said edge down onto the strip as it passes around said roll.

4,576,675
SYSTEM FOR SECURING A PLURALITY OF OBJECTS TOGETHER WITH ADHESIVE TAPE
Robert A. Brux, Salinas, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Aug. 13, 1984, Ser. No. 640,423
Int. Cl.⁴ B32B *31/04;* **B65B** *11/48, 13/02, 27/10*
U.S. Cl. 156—468 **1 Claim**



1. Apparatus for securing a plurality of objects together with an adhesive tape, comprising, in combination:

adhesive tape supply means including a roll of adhesive tape having a free end;

a securing station disposed adjacent to said tape supply means and including securing means for securing a predetermined length of tape about a plurality of objects positioned at said securing station, said securing station including yieldable flap means engageable by said plurality of objects and said tape, said yieldable flap means being operable to wrap said tape about said plurality of objects and to secure said tape thereto, said yieldable flap means including a first spring biased flap and a second spring biased flap, said flaps cooperating to provide support for said predetermined length of tape and yieldable when a plurality of objects is placed in engagement therewith to conform to the outer surface of said plurality of objects and press said predetermined length of tape into adhesive engagement therewith, said flaps being at least partially superposed with respect to one another to provide support for said predetermined length of tape, at least one of said flaps being generally L-shaped and including an outer flap portion which engages the tape and causes the tape to overlap when said objects are secured together;

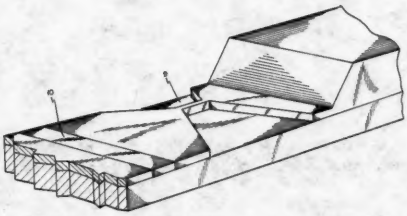
delivery means for periodically delivering a predetermined length of tape to said securing station and including gripper means and prime mover means for moving said gripper means between a first position whereat said gripper means grips the free end of adhesive tape projecting from said roll of adhesive tape to a second position whereat a predetermined length of tape is positioned at said securing station; and

separating means for separating said predetermined length of tape from said roll of adhesive tape prior to securing said predetermined length of tape about said plurality of objects.

4,576,676
THICK CRYSTALLINE FILMS ON FOREIGN SUBSTRATES

Henry I. Smith, Sudbury; Harry A. Atwater, Somerville, and Michael W. Geis, Acton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 24, 1983, Ser. No. 497,620
Int. Cl.⁴ C30B *1/08*
U.S. Cl. 156—603 **6 Claims**



1. A method of forming a thick crystalline film with large, uniform-textured, grains and aligned crystallographic orientations upon a substrate, the method comprising:

(a) depositing a film to be processed upon the surface of the substrate;

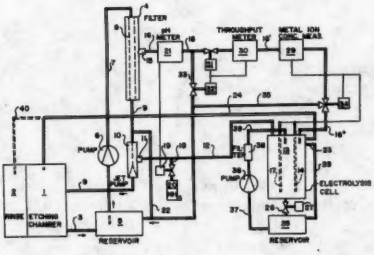
(b) establishing a pattern of vertical constriction in a portion of the film; the pattern being characterized by a thin section and a section of graduated thickness connecting the thin section to the rest of the deposited film; and

(c) heating the film sequentially from the thin section to the rest of the film to induce recrystallization, whereby the orientation of the thin section will be passed on to the bulk of the deposited film.

4,576,677
METHOD AND APPARATUS FOR REGENERATING AN AMMONIACAL ETCHING SOLUTION

Wolfgang Faul; Leander Fürst, both of Jülich; Walter Holzer, Meersburg, and Bertel Kastening, Hamburg, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,087
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313293; Nov. 8, 1983, 3340343
Int. Cl.⁴ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—642 **19 Claims**



1. Method of regenerating an ammoniacal etching solution by re-oxidation comprising the steps of:

withdrawing an ammoniacal etching solution, which is at least partially spent and contains etched metals in ionic form, from an etching chamber;

leading a first part of said withdrawn solution in a first path leading back to said etching chamber, passing a second part of said solution withdrawn from said chamber through an electrolysis cell which has a cathode and an anode and in which said solution serves as the electrolyte during passage therethrough, whereby said metal contained therein is deposited at said cathode and oxygen is evolved at said anode, and then causing the electrolyzed solution to flow in a second path leading back to said etching chamber.

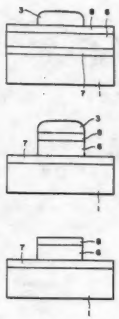
collecting the oxygen anodically evolved in said electrolysis cell; and

introducing said collected oxygen into said electrolyzed solution and intensively mixing the oxygen with the solution in a portion of said second path of said solution leading back to said etching chamber.

4,576,678
PATTERN FORMING METHOD

Hiroshi Shibata, Kanagawa, Japan, assignor to VLSI Technology Research Association, Kanagawa, Japan

Continuation of Ser. No. 423,364, Sep. 24, 1982, Pat. No. 4,489,101, which is a continuation of Ser. No. 171,506, Jul. 23, 1980, abandoned. This application Sep. 13, 1984, Ser. No. 650,144
Claims priority, application Japan, Jul. 25, 1979, 54-96215
Int. Cl.⁴ H01L *21/306*; C23F *1/02*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—643 **17 Claims**



2. A pattern forming method comprising the steps of:

forming a first film layer of a compound containing silicon and nitrogen directly on a substrate by plasma reaction, wherein the substrate comprises multiple layers;

forming a resist film layer in a desired pattern on said first layer;

etching said first film layer with said resist film layer as a mask;

forming a second film layer on said substrate having said first film layer thus etched and on the resist film layer;

removing said first film layer from said substrate with an etchant which does not etch said second film layer; and

etching at least one of the multiple layers of said substrate with said second film layer as a mask with an etchant which does not etch said second film layer.

4,576,679
METHOD OF FABRICATING A COLD SHIELD

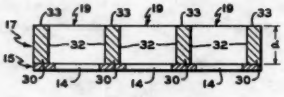
William J. White, Chelmsford, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 520,951, Aug. 8, 1983, abandoned, which is a division of Ser. No. 248,127, Mar. 27, 1981, Pat. No. 4,431,918. This application Nov. 5, 1984, Ser. No. 668,681
Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—644 **4 Claims**

1. A method of fabricating a shield for limiting the radiation received by individual detectors within a detector array in an

electromagnetic radiation detection system to the radiation provided to the detectors by optics within the system, the shield comprising a member of etchable glass having apertures formed therein, comprising:

forming, on a first surface of an etchable glass member, an etch resist pattern, the etch resist pattern protecting areas of the glass where supporting walls of the shield will be located, the glass being exposed where the apertures will be located, the etch resist pattern defining the size and shape of each aperture, the size and shape of each aperture being in predetermined relation to the size and shape of the detectors in order to shield the detectors from electromagnetic radiation generated outside the field of view of the optics;



etching the glass to form the apertures;

removing the etch resist; and

mounting the formed glass shield upon an array of individual detectors.

4,576,680

METHOD OF SIZING PAPER

Kimio Kawatani, Suita; Takashi Fujikawa, Kyoto, and Eiji Watanabe, Osaka, all of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Arakawa Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,081

Claims priority, application Japan, Feb. 7, 1983, 58-18563

Int. Cl.[4] C07D *307/60*; D21H *3/08*

U.S. Cl. 162—158 **10 Claims**

1. A method of sizing paper comprising adding to a pulp slurry a paper sizing agent containing a reaction product and/or a hydrogenation product of said reaction product, said reaction product being prepared by adding maleic anhydride to branched internal olefins having 14 to 36 carbon atoms which branched internal olefins are obtained by oligomerizing one member or a mixture of two or more members of a class of other olefins having 6 to 18 carbon atoms in the presence of an acid catalyst.

4,576,681

MACHINE FOR MAKING A FIBER WEB WITH SHARPLY DEFINED EDGES

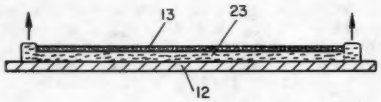
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,689

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327056

Int. Cl.[4] D21F *1/00*

U.S. Cl. 162—301 **3 Claims**



1. In a machine for producing a fiber web between a felt member and a wire member, and including a headbox for dispensing a fiber suspension stream of a selected width into a feed-in area formed between said felt member and said wire member, the improvement comprising said felt member directly loops a portion of the circumference of a forming roll, said wire member directly loops a portion of that portion of the felt member that loops the forming roll so as to define a curved dehydration zone between the felt member and wire member, said wire member having a width less than the width of the fiber suspension stream being dispensed by said headbox and the width of the felt member so that in the area of the dehydration zone there is produced a fiber web having sharply defined lateral edges, and the dehydration zone is free of side walls for sideways limitation of the fiber suspension.

4,576,682

LONG-NIP PRESS FOR A PAPER MAKING MACHINE

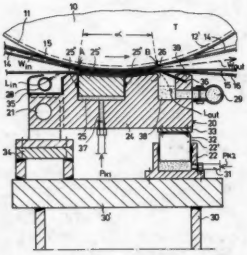
Jorma Laapotti, Palokka, Finland, assignor to Valmet Oy, Finland

Filed Mar. 19, 1984, Ser. No. 590,951

Claims priority, application Finland, Mar. 23, 1983, 830995

Int. Cl.[4] D21F *3/06*

U.S. Cl. 162—358 **8 Claims**



1. In a long-nip press, in which a press zone is formed between a counter-roll and a press-shoe arrangement or between a counter-shoe and the press-shoe arrangement, through which press zone a fibrous web passes between a felt and a press belt or between two press belts with the press shoe arrangment being disposed inside a loop of the press belt, said press including means for hydrodynamically lubricating the press belt by feeding lubricant thereon before the press zone, and means for receiving lubricant off the press belt after the press zone,

the improvement comprising

said press shoe arrangment comprises

a frame component,

means for articulately engaging said frame component with a stationary structure,

a first shoe component disposed in said frame component,

first pressure means for loading said first shoe component, disposed between said first shoe component and said frame component,

a second shoe component formed as a part of said frame component, said second shoe component substantially immediately following said first shoe component in the direction of web run,

second pressure means for loading said second shoe component, and

said press shoe arrangement including means for increasing compression pressure applied by said first and second shoe components to the web in the press zone in one or more steps in a running direction of the fibrous web, and means for rapidly lowering the compression pressure applied to the web in the press zone from the maximum compression pressure applied therein to substantially no pressure.

4,576,683

METHOD FOR SEPARATING CARBOXYLIC ACIDS FROM MIXTURES WITH NON-ACIDS

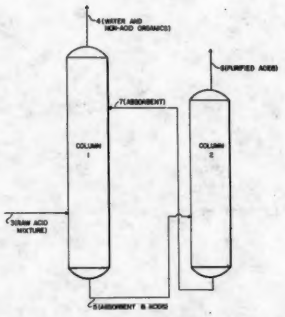
Lester R. Cohen, The Woodlands, Tex., assignor to Badger B.V., The Hague, Netherlands

Continuation-in-part of Ser. No. 399,717, Jul. 19, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,701

Claims priority, application Netherlands, Jul. 24, 1981, 8103517

Int. Cl.[4] C07C 51/44; B01D 3/40

U.S. Cl. 203—15 19 Claims



1. A method for separating C_1–C_{10} aliphatic and C_3–C_{10} olefinic carboxylic acids from mixtures with non-acids comprising an extractive distillation treatment, using an amide as an extractant, to recover an extractant-acid mixture followed by recovery of the acids from the extractant-acid mixture by rectification, characterized in that the amide extractant used in the extractive distillation treatment is a lactam from the group consisting of lactams having a 5-membered ring and lactams having a 6-membered ring, said lactam being a liquid at ambient temperature and being miscible in all proportions under the process conditions with the mixture of acids and non-acids.

4,576,684

METHOD FOR THE CONTINUOUS ELECTROLYTIC DEPOSITION OF METALS

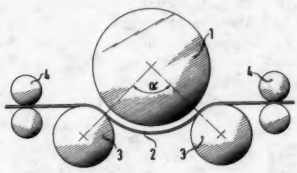
Werner Bechem, Hilchenbach; Hubertus Peters, Dortmund; Jürgen Solms, Hilchenbach, and Dietrich Wolfhard, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,444

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343978

Int. Cl.[4] C25D 7/06

U.S. Cl. 204—28 6 Claims



1. Method for continuous electrolytic deposition of metals from aqueous solutions of metallic salts onto a metal strip using a high flow electrolyte exchange in the space between the anode and cathode which is sufficient to attain high current densities at low voltages comprising, moving a looped portion of a cathodic metal strip past an anodic metal cylinder, and constantly introducing fresh electrolytic solution into the space formed between the anode and cathode, by controlling the speed of rotation of said anodic metal cylinder.

4,576,685

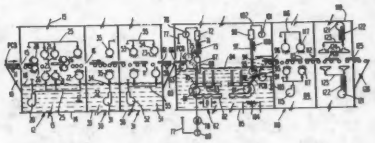
PROCESS AND APPARATUS FOR PLATING ONTO ARTICLES

Daniel L. Goffredo, Riverton, N.J.; Walter J. Meyer, and Horst Blüsing, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,049

Int. Cl.[4] C25D 5/54

U.S. Cl. 204—30 21 Claims



1. A process for deposition of metal onto surfaces of generally flat articles, comprising the steps of:

(a) providing the articles with at least some generally flat exterior surfaces having portions generally of non-metallic surface construction;

(b) continuously and serially delivering the articles along a predetermined path;

(c) preparing the articles for electroless metal deposition on surface portions as they are continuously delivered along their predetermined path, by application of at least one chemical solution and at least one rinse thereto;

(d) wherein the delivering step includes moving the articles in generally flat horizontal orientation along a generally horizontal path at a first rate of travel for at least a portion of the travel of articles along their predetermined path prior to the delivery of articles into an electroless deposition bath;

(e) transferring the articles from generally flat horizontal orientation to generally vertical orientation as they are delivered along their predetermined path; and

(f) substantially continuously moving the articles in serial surface-facing-surface relation while in their generally vertical orientation along a generally horizontal path through a bath of electroless metallic solution at a second rate of travel substantially slower than the first rate of travel, to apply a thin metallic coating thereto.

4,576,686

PROCESS FOR PRODUCING ALUMINUM SUPPORT FOR LITHOGRAPHIC PRINTING PLATES

Sakaki Hirokazu, and Kazushige Takizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1984, Ser. No. 654,696

Claims priority, application Japan, Sep. 27, 1983, 58-178756

Int. Cl.[4] C25D 11/16; C25F 3/04

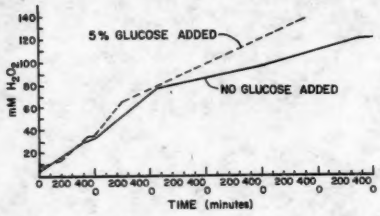
U.S. Cl. 204—33 20 Claims

1. A process for producing an aluminum support for a lithographic printing plate, comprising a step of electrolytically graining the surface of an aluminum plate in an aqueous solution of electrolyte comprising hydrochloric acid and nitric acid in a ratio by weight of from 1/1 to 1/3.5 by applying an electric current having an asymmetrical alternating wave form.

4,576,687
HYDROGEN PEROXIDE PRODUCTION USING A NON-AQUEOUS SYSTEM

William Hertl, Corning, and Howard H. Weetall, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,565
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—157.5 4 Claims



1. A process for making hydrogen peroxide comprising:
(a) mixing a catalystically effective amount of a photo-excitable quinone compound with ethylene glycol, substantially free from water;
(b) purging the quinone compound and ethylene glycol mixture with oxygen; and
(c) irradiating the mixture with electromagnetic radiation which excites the quinone compound, thereby oxidizing the ethylene glycol and forming hydrogen peroxide.

4,576,688
PRODUCTION OF POLY(P-PHENYLENE) FROM 4,4'-DIHALOBIPHENYL AND LITHIUM USING ULTRASONIC WAVES

Lawrence D. David, Florham Park, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,005
Int. Cl.[4] C08G *61/10;* C08F *2/56*
U.S. Cl. 204—157.62 7 Claims

1. A process for producing poly(p-phenylene) which comprises subjecting a liquid reaction medium containing 4,4'-dihalobiphenyl and lithium metal as coupling reactants to activation with ultrasonic energy.

4,576,689
PROCESS FOR ELECTROCHEMICAL METALLIZATION OF DIELECTRICS

Almaxud M. Makkaev, ulitsa Zolotodolinskaya, 29, kv. 308, Novosibirsk; Oleg I. Lomovsky, ulitsa Ostrovskogo, 101a, kv. 22, Berdsk Novosibirskoi oblasti; Jury I. Mikhailov, ulitsa Maltseva, 1, kv. 31, and Vladimir V. Boldyrev, ulitsa Tereshkovoi, 38, kv. 29, both of Novosibirsk, all of U.S.S.R.

PCT No. PCT/SU80/00063, § 371 Date Feb. 18, 1981, § 102(e) Date Feb. 18, 1981, PCT Pub. No. WO80/02570, PCT Pub. Date Nov. 27, 1980
PCT Filed Apr. 25, 1980, Ser. No. 243,929
Int. Cl.[4] C25D *5/54;* C23C *18/14*
U.S. Cl. 204—20 13 Claims

1. A process for producing a conductive layer on a dielectric consisting essentially of:
(a) wetting at least a portion of the surface of the dielectric with a solution comprising:

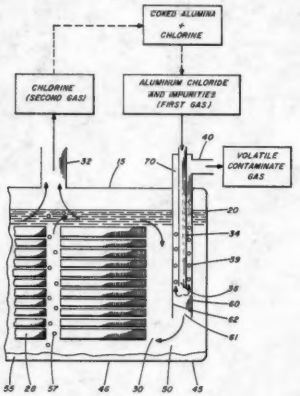
	grams/liter
copper salt	50–350
hypophosphorous acid salt	50–350
stabilizing agent	0.004–250
water	up to 1 liter

(b) heat-treating at least the portion of the surface of the dielectric wetted with the solution at a temperature in the range of 80° to 350° C. to evaporate the water and decompose the solution whereby a conductive layer is formed.

4,576,690
SEPARATION OF VOLATILE IMPURITIES FROM ALUMINUM CHLORIDE BEFORE ELECTROLYSIS

James R. Fields, Penn Township, Westmoreland County; Elmer H. Rogers, Jr, and Larry K. King, both of Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 15, 1985, Ser. No. 723,452
Int. Cl.[4] C25C *3/06, 3/08*
U.S. Cl. 204—67 19 Claims



1. A method for production of aluminum by electrolysis of $AlCl_3$ in a cell comprising
an electrolysis chamber containing an electrode and a molten salt bath contacting said electrode,
a gas separation compartment containing molten salt bath,
a partition separating the chamber from the compartment,
a gas inlet tube having an orifice in the compartment,
a gas outlet for removing gas from the compartment, said outlet being spaced from said inlet tube orifice,
said method comprising the steps of
(a) supplying $AlCl_3$ containing impurities that are insoluble in the bath through the inlet tube into the bath,
(b) evaporating said impurities from the bath and removing said impurities through the gas outlet,
(c) dissolving $AlCl_3$ into the bath,
(d) transferring bath containing dissolved $AlCl_3$ from the compartment into the chamber, and
(e) electrolyzing $AlCl_3$ in the chamber to produce aluminum, Cl_2 and used bath having a lower concentration of $AlCl_3$ than the bath of step (d).

4,576,691
ETCHING OPTICAL SURFACES ON GAAS

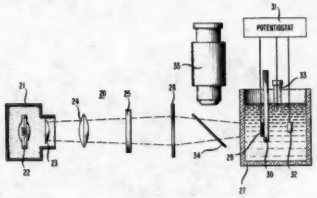
Paul A. Kohl, Chatham; Lawrence E. Smith, Plainfield, and Harvey S. Trop, South Plainfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1984, Ser. No. 636,177
Int. Cl.[4] C25F *3/12, 3/14*
U.S. Cl. 204—129.3 11 Claims

1. A process for fabricating an optical device comprising at least one n-type or intrinsic compound semiconductor consisting of at least 95 mole percent gallium arsenide comprising the step of etching at least part of the compound semiconductor to

produce a compound semiconductor surface of optical quality characterized in that the etching procedure is an electrochemical photoetching procedure in which electric current is passed through the compound semiconductor, electrolytic solution with conductivity greater than 0.0001 mhos/cm and anode in which the electrochemical photoetching procedure further comprises

a. applying a potential to the semiconducting compound which is between the maximum potential of the valence



band of the semiconductor compound in the electrolytic solution and the minimum potential of the conduction band of the semiconductor compound in the electrolytic solution;

b. illuminating the part of the surface of the compound semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band; and

c. the electrolytic solution comprises aqueous alkaline solution with pH greater than 11.

4,576,692

METHOD FOR CONTROLLING THE OPERATION OF A MICROWAVE-EXCITED OXYGEN PLASMA SURFACE TREATMENT APPARATUS

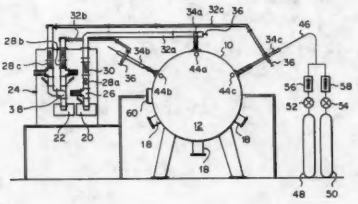
Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Toshiba, both of, Japan

Filed Jun. 11, 1984, Ser. No. 619,174

Claims priority, application Japan, Jun. 14, 1983, 58-104906; Jun. 14, 1983, 58-104904; Jun. 14, 1983, 58-104905

Int. Cl.⁴ C07C *3/24, 13/00*

U.S. Cl. 204—165 **14 Claims**



1. A method for sequentially controlling the operation of an apparatus for modifying the surface of polymer products with microwave-excited oxygen plasma, said apparatus including a microwave power generator operatively connected by a waveguide with a microwave discharge tube to excite a stream of oxygen gas flowing from a source of oxygen gas through said discharge tube into a reactor, said stream of oxygen gas being controlled by a flow control valve provided between said source of oxygen gas and said discharge tube, said reactor being adapted to be evacuated to continuously maintain the pressure therein at substantial vacuum conditions throughout the operational period of said apparatus, said method comprising the steps of:

after commencement of evacuation of said reactor, continuously monitoring and measuring the pressure in said reactor and generating a first pressure signal when said pressure decreases to a predetermined pressure level and a second pressure signal when said pressure thereafter increases to fall within a predetermined pressure range higher than said predetermined pressure level;

opening said flow control valve in response to said first pressure signal to allow a stream of oxygen gas to flow at a predetermined flow rate into said discharge tube and thence into said reactor;

turning on said microwave power generator in response to said second pressure signal to excite said stream of oxygen gas in said discharge tube to generate oxygen plasma which is then transferred into said reactor to react upon the polymer products received therein;

continuously monitoring and measuring the density of oxygen plasma thus generated and generating a density signal when the measured plasma density is within a predetermined density range; and

closing said flow control valve and turning off said microwave power generator in response to said density signal and after a lapse of predetermined time period from the generation of said density signal.

4,576,693

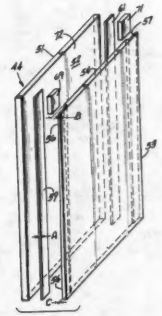
NUCLEIC ACID SEQUENCING ELECTROPHORESIS APPARATUS AND METHOD OF FABRICATING

John H. Kreisher, Ridgefield, and Charles A. Nalbantian, New Haven, both of Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.

Filed Jan. 14, 1985, Ser. No. 691,057

Int. Cl.⁴ G01N *27/26*

U.S. Cl. 204—180.1 **19 Claims**



15. A method of fabricating a wedge shaped electrophoresis gel slab mold comprising the steps of: providing two mold plates each having generally flat primary surfaces, establishing a pair of matching, inclined secondary surfaces on opposed margins of one of said plates, said secondary surfaces being offset from the adjacent primary surface, disposing a ribbon of gasket material of uniform thickness in areal contact with each of said secondary surfaces, and clamping the plates together with the gasket material sandwiched between the plates.

4,576,694

METHOD FOR PRODUCING ELECTRICALLY INSULATED CONDUCTOR

Eiki Jidai, and Aiichiro Hashizume, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 370,907, Apr. 22, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 643,762
Claims priority, application Japan, May 9, 1981, 56-71817
Int. Cl.[4] C25D *13/06, 13/10, 13/12*
U.S. Cl. 204—181.1 6 Claims

1. A method for producing an electrically insulated conductive body which comprises the steps of:

(a) immersing an electrically conductive body into an electrodeposition paint composition containing no chemical curing accelerator, said paint composition containing mica powder as an inorganic insulative substance and a water-dispersion varnish as an organic insulative substance, both substances being dispersed in water;

(b) forming an electro-deposited layer on said electrically conductive body by electrophoresis, followed by heat-setting the resulting insulative coating layer;

(c) immersing the coated electrically conductive body into a water-soluble resin solution containing therein a water-soluble chemical curing accelerator, followed by heat-setting the same; and

(d) impregnating the electro-deposited conductive body with an impregnating resin containing no chemical curing accelerator, followed by heat-setting the same.

4,576,695

ADHESION PROMOTERS FOR SANITARY CAN COATINGS

Phillip M. Owens, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,692
Int. Cl.[4] C25D *13/10, 13/14, 13/20*
U.S. Cl. 204—181.4 6 Claims

1. A method for improving the adhesion of water-base paints to an untreated aluminum substrate which comprises

(a) cleansing the untreated aluminum surface with an aqueous acid wash and water washing said cleaned surface

(b) subjecting the untreated cleaned aluminum to an electrocoating paint composition comprising an epoxy-acrylate resin, a crosslinking agent and about 0.01 to about 2.0 parts, basis total resin, of an adhesion promoter wherein said promoter is an alkaline earth metal salt of citric acid and the metal is selected from the group consisting of calcium, magnesium and zinc

(c) electrodepositing said composition to deposit a film coating on said substrate

(d) curing the deposited film.

4,576,696

PROCESS FOR THE PREPARATION OF A BIOLOGICALLY ACTIVE EXTRACT

Robert Oertli, Möhlin, Switzerland, assignor to Solco Basel AG, Basel, Switzerland

Filed Sep. 19, 1984, Ser. No. 652,343
Claims priority, application Switzerland, Oct. 5, 1983, 5413/83
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.6 8 Claims

1. A process for the preparation of a biologically active, low-salt, pyrogen-free, sterile and antigen-free complete extract of mammal organs and of cell cultures, the extract consisting of a mixture of biologically active substances having a molecular weight of less than 10,000 Daltons, which comprises comminuting with disintegration of the cells the starting material which has been procured, and may have been stored, under low-germ or sterile conditions, rapidly heating the comminuted and disintegrated material in a heat exchanger to a temperature from 70° to 90° C. and rapidly again cooling to a low temperature, separating the products thereby precipitated from the solution by centrifugation, removing the substances having a molecular weight of greater than 10,000 Daltons from the solution by ultrafiltration and removing the salt ions from the remaining solution by electrodialysis, the whole process being carried out with exclusion of any foreign substances other than water, and without the use of any carrier material for separation methods.

4,576,697

SYNTHESIS OF CARBON-CONTAINING INTERCALATABLE LAYERED TRANSITION METAL CHALCOGENIDES

David N. Palmer, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 21, 1983, Ser. No. 487,148
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 N 4 Claims

1. A process for treating the surface of a transition metal substrate to form into the surface a carbon-containing intercalatable layered transition metal chalcogenide having the general formula M_nX_2C where M is a transition metal selected from the group consisting of Ti, V, Cr, Fe, Zr and Ta; X is sulfur; and n is 1–2; which comprises:

ion implanting sulfur at an implantation energy in the range of about 150–200 kiloelectron volts and at a saturation dosage of about 10^{18} sulfur atoms/cm^2 into the surface of the transition metal substrate to a depth of about 1000–2200 Å; and

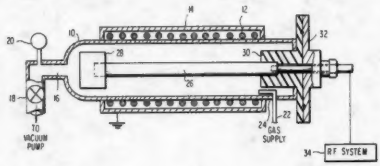
then ion implanting carbon at an implantation energy in the range of about 150–200 kiloelectron volts and at a saturation dosage of about 10^{18} carbon atoms/cm^2 into the surface of the sulfur-implanted transition metal substrate to a depth of about 1000–2200 Å.

4,576,698

PLASMA ETCH CLEANING IN LOW PRESSURE CHEMICAL VAPOR DEPOSITION SYSTEMS

James P. Gallagher, Newburgh, and Howard W. Schmidt, Jr., Walden, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,518
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192 E 6 Claims



1. A method of removing deposition products from the interior of a chemical vapor deposition chamber comprising the steps of:

removing a device processed in said chamber and providing a pair of r.f. electrodes relative to said chamber;

mounting one of said electrodes into said chamber following removal of the device processed and sealing said chamber;

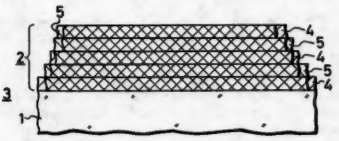
supplying a cleaning gas into said chamber, and

supplying r.f. electrical power between said pair of electrodes to establish an r.f. plasma of the cleaning gas within said chamber to clean by plasma etching deposition products from the interior of said chamber.

4,576,699
MAGNETO-OPTICAL RECORDING MEDIUM AND METHOD OF MAKING SAME

Noboru Sato, Kanagawa, and Tomiji Tanaka, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,383
Claims priority, application Japan, May 25, 1983, 58-92067
Int. Cl.[4] C23C *15/00*; G11B *5/64*
U.S. Cl. 204—192 M 4 Claims



1. A method for manufacturing a magneto-optical recording medium comprising the steps of:

providing a transition metal source and a rare earth metal source in spaced relation,

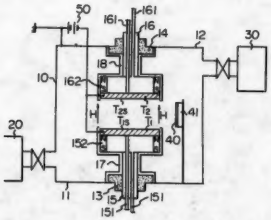
simultaneously depositing said transition metal and said rare earth metal by co-sputtering the two metals on a base, and

providing relative movement between said base and said source during such co-sputtering to produce a multilayer recording layer in which the relative concentration between said rare earth metal and said transmission metal varies cyclically in the thickness dimension of the recording layer.

4,576,700
PERPENDICULAR MAGNETIC RECORDING MEDIUM METHOD FOR PRODUCING THE SAME, AND SPUTTERING DEVICE

Sadao Kadokura, Hachioji; Kazuhiko Honjo; Takashi Tomie, both of Hino, and Masahiko Naoe, Tokyo, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 466,863
Claims priority, application Japan, Feb. 16, 1982, 57-22080
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 M 3 Claims



1. A method for producing a perpendicular magnetic recording medium comprising a nonmagnetic base, and two magnetic layers successively formed on said nonmagnetic base, said layers comprising a first layer of low-coercive force material and a second layer of a cobalt alloy comprised of Co-Cr or Co-Cr and an additional elements of the group of W, Mo, Ru, Pt, As, Ni, Re and Ta, and which has a direction of easy magnetization in a direction perpendicular to the film surface, and wherein said layer of low-coercive force consists of a Co-Ta alloy which is mainly composed of cobalt and additionally tantalum, said method comprising the steps of: forming layer of said Co-Ta alloy by an opposed targets sputtering method by generating a magnetic field in a direction perpendicular to the surfaces of a pair of targets arranged opposite to one another within a sputtering device, and depositing material of said targets on the nonmagnetic base, which is located beside a space between said pair of targets and which faces said space; and forming said first and second cobalt alloy layers by means of the opposed targets. sputtering method.

4,576,701
NICKEL ELECTROPLATING ANODE AND METHOD OF FORMING

Takeo Meguro, 16-11, Nishiogi Minami 4-chome, Suginami-ku, Tokyo, Japan

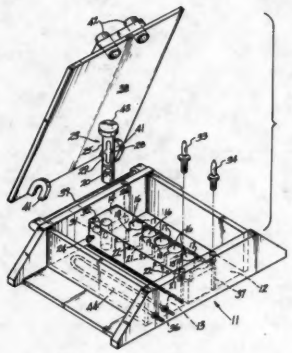
Filed Jun. 27, 1984, Ser. No. 625,088
Int. Cl.[4] C25D *17/12*; C25B *11/02*; B21D *22/00*; H01R *43/00*
U.S. Cl. 204—280 6 Claims

1. A plating electrolytic nickel anode comprising a spherical without melting and casting body produced by directly and plastically deforming a plate-like electrolytic nickel anode of high purity.

4,576,702
ANALYTICAL ELECTROELUTION DEVICE

Lawrence J. Peck, Cambridge, Mass., and John H. Kreisher, Ridgefield, Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.

Filed Nov. 5, 1984, Ser. No. 668,562
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 12 Claims



1. An electroelution device for removing and collecting charged biological particles from a plurality of small gel slices or samples simultaneously comprising at least two fluid tight compartments separated by a bridge element, said bridge element being formed with a plurality of spaced recesses defining sample supports, said bridge being further formed with a plurality of conduits, one conduit being individual to each sample support and each conduit having a first outlet communicating with a mating sample support and a second outlet communicating with one of said compartments.

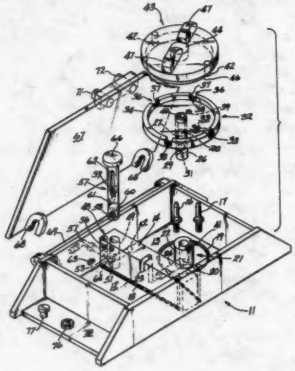
4,576,703
PREPARATORY ELECTROELUTION DEVICE

Lawrence J. Peck, Cambridge, Mass.; John H. Kreisher, Ridgefield, and Alan L. Walker, New Haven, both of Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.

Filed Nov. 5, 1984, Ser. No. 668,571
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 12 Claims

1. An electroelution receptacle useful to remove charged particles such as biological substances from a gel slice comprising at least two major fluid tight compartments separated by a bridge element, a first valve disposed in one compartment including a valve body and a valve stem within said valve

body, a conduit connecting said valve body to the other compartment, through said bridge element, said valve stem having a central cavity defining a recovery reservoir, said valve stem being movable from a first position in which said first valve is open so that said recovery reservoir communicates through said conduit with an overflow outlet to a second position in



which said first valve is closed and said overflow outlet is cut off, said valve stem supporting at one end a gel specimen tray, a closure member for covering said specimen tray and making a releasable keyed connection with said specimen tray operable manually to move said valve stem to said first and second positions of said valve stem, selectively.

4,576,704

APPARATUS FOR THE ELECTROCHEMICAL DETECTION OF THE OXYGEN CONTENT OF LIQUIDS

Erwin Chiusole, Bregenz, Austria, and Hans Züllig, Rheineck, Switzerland, assignors to Züllig AG Rheineck, Rheineck, Switzerland

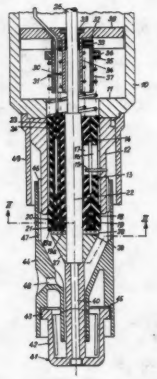
PCT No. PCT/CH83/00139, § 371 Date Jan. 29, 1985, § 102(e) Date Jan. 29, 1985, PCT Pub. No. WO84/04814, PCT Pub. Date Dec. 6, 1984

PCT Filed Dec. 12, 1983, Ser. No. 703,229

Claims priority, application Switzerland, Jun. 2, 1983, 3015/83

Int. Cl.[4] G01N *27/38*

U.S. Cl. 204—402 **7 Claims**



1. In an apparatus for the electrochemical measurement of the oxygen content of liquids, said apparatus including first and second electrodes whose free ends can be immersed in the liquid whose oxygen content is to be measured, the oxygen content of the liquid being measured by an electric current occurring between the two electrodes, the apparatus also including a rotatable grinding device which can contact the free ends of said electrodes to clean them while the shape, size and mutual spacing of the free ends of said electrodes remain unchanged, the improvement wherein

said first and second electrodes are embedded in respective first and second annular bodies of insulating material, each of said first and second annular bodies having an axial end surface which faces the liquid whose oxygen content is to be measured, the free ends of said first and second electrodes being exposed at the axial end surface of the respective annular body in which it is embedded, said first and second annular bodies being axially movable relative to one another,

said apparatus includes first and second spring means which respectively cooperate with said first and second annular bodies to individually bias their said axial end surfaces toward said rotatable grinding device, and

said apparatus includes at least one adjusting means for determining the biasing force of one of said first and second spring means exerted on its associated annular body, adjustment of said adjusting means enabling a uniform cleaning of the free ends of said two electrodes by said grinding device.

4,576,705

APPARATUS WITH POLAROGRAPHIC SENSOR TO DETECT CONCENTRATIONS OF PLURALITY OF GAS COMPONENTS

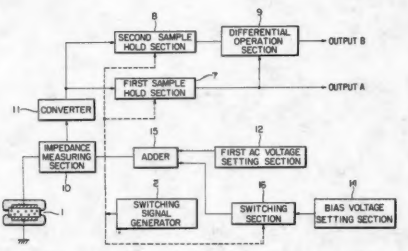
Haruyoshi Kondo; Hideaki Takahashi; Keiichi Saji; Takashi Takeuchi, and Kiyoharu Hayakawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 24, 1984, Ser. No. 613,969

Claims priority, application Japan, May 26, 1983, 58-91441

Int. Cl.[4] G01N *27/48*

U.S. Cl. 204—406 **11 Claims**



2. An apparatus for detecting the concentration of a plurality of gas components, comprising:

a polarographic solid electrolytic sensor including an oxygen ionic conductor having opposite surfaces, a cathode placed on one surface of said oxygen ionic conductor, an anode placed on the other surface of said oxygen ionic conductor to supply a voltage, and means covering said surface where said cathode is placed for regulating the quantity of gas which diffuses toward said cathode;

switching control means for performing a jtime-division switching operation during first time slots for detecting the internal resistance of said polarographic solid electrolytic sensor, second time slots for detecting the concentration of oxygen gas, and third time slots for detecting the composite concentration of oxygen gas, carbon dioxide gas and steam;

internal resistance detecting means for measuring the internal resistance of the polarographic solid electrolytic sensor by applying a voltage thereto so that the sensor is operated in the resistance control region during said first period;

first voltage applying means having

a voltage drop calculating section for calculating a voltage drop component caused by the current flowing through said polarographic solid electrolytic sensor in accordance with the internal resistance detected during the first time slots and the current flowing through said polarographic solid electrolytic sensor,

an attenuating section for attenuating the output voltage from said voltage drop calculating section,

constant voltage adding means for adding the first voltage to the output voltage from said attenuating section and for generating a first voltage having a magnitude which causes said polarographic solid electrolytic sensor to respond only to oxygen gas, and

means for applying the output from said constant voltage adding means to said polarographic solid electrolytic sensor during the second time slots under control of said switching control means;

second voltage applying means for applying a second voltage obtained by adding the first voltage and a constant additional voltage to said polarographic sensor so that said polarographic sensor measures the composite concentration of oxygen gas, carbon dioxide gas and steam;

said second voltage applying means having

an additional voltage setting section for generating an additional voltage,

an addition section for adding the additional voltage from said additional voltage setting section and the first voltage from said first voltage applying means to obtain the second voltage, and

a resistor attenuation section, between said additional voltage setting section and said addition section, for attenuating the second voltage set by said second voltage applying means in accordance with change in composite concentration of carbon dioxide gas and steam;

electric signal detecting means for detecting electric signals from said polarographic sensor when the first and second voltages are applied to said polarographic sensor, respectively, and for generating a signal corresponding to the oxygen concentration and a signal corresponding to the composite concentration of oxygen gas, carbon dioxide gas and steam;

first sample holding means connected to said electric signal detecting means, for storing data corresponding to the signal which corresponds to the oxygen concentration and which is generated from said electric signal detecting means when the first voltage is applied to said polarographic sensor;

second sample holding means connected to said electric signal detecting means, for storing data corresponding to the signal which corresponds to the composite concentration of oxygen gas, carbon dioxide gas and steam and which is generated from said electric signal detecting means when the second voltage is applied to said polarographic sensor; and

operating means connected to said first and second sample holding means, for subtracting the signal corresponding to the oxygen concentration from the signal corresponding to the composite concentration of oxygen gas, carbon dioxide gas and steam, and for generating a signal corresponding to the composite concentration of carbon dioxide gas and steam.

4,576,706

FLOWTHROUGH-TYPE ELECTROLYTIC CELL

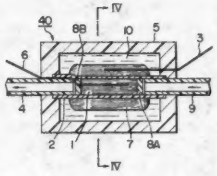
Yoshinori Takata, Chiba, and Mamoru Taki, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,483

Claims priority, application Japan, Sep. 5, 1983, 58-162786

Int. Cl.[4] G01N *27/42*

U.S. Cl. 204—409 **27 Claims**



1. A flowthrough-type electrolytic cell, which comprises:

a chamber adapted to contain an electrolyte solution;

pipe means whose one end is communicated with a sample inlet and whose other end is communicated with a sample outlet, said pipe means being made of an ion exchange material, said pipe means being located in said chamber;

a working electrode provided in the pipe means, said working electrode comprising electroconductive material in the form of a bundle of fibers, or particulate matter, packed in the pipe means; and

a counterelectrode provided outside the pipe means and within said chamber.

4,576,707

PROCESS FOR BENEFICIATING COAL

Michael Siskin, Livingston, and Glen B. Brons, Phillipsburg, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 600,431, Apr. 16, 1984, Pat. No. 4,491,513. This application Dec. 27, 1984, Ser. No. 686,609

Int. Cl.[4] C10G *1/04*

U.S. Cl. 208—8 LE **26 Claims**

15. A process for beneficiating coal which process comprises contacting the coal in two different stages with an aqueous ammonium salt solution wherein the stages are characterized as follows:

stage 1 is conducted at pH in the range of about 5 to 9 in the presence of an aqueous ammonium salt solution;

stage 2 being conducted at a pH in the range of about 0.5 to 5 or about 9 to 12 in the presence of an organic solvent at a temperature in the range of about 0° C. to about 300° C. for an effective amount of time.

4,576,708

BENEFICIATION OF SHALE KEROGEN AND ITS CONVERSION INTO SHALE OIL

Uriel M. Oko, Tulsa, Okla., and Robert M. Baldwin, Golden, Colo., assignors to Cities Service Oil & Gas Corp., Tulsa, Okla.

Filed Aug. 6, 1984, Ser. No. 638,123

Int. Cl.[4] C10G *1/04*

U.S. Cl. 208—11 LE **108 Claims**

1. A process for the production and conversion of solid shale kerogen to produce shale oil comprising in serial combination the steps of:

(a) grinding crushed shale into a first product consisting essentially of generally inert matter and generally liberated solid kerogen having an average fineness of between about 5 microns to about 250 microns;

(b) treating the surface of the first product including the ground-liberated solid kerogen of step (a) with a first collec-

tor in order to render the ground liberated solid kerogen air-avid and water-repellent;

(c) introducing the ground-treated first product of step (b) into a first water suspension medium having a first frother;

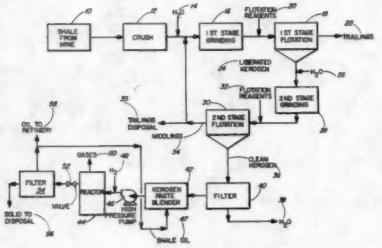
(d) suspending the ground-treated first product in the first water suspension medium by a first means for agitation;

(e) aerating the first water suspension medium in order to form a layer of foam on top of the first water suspension medium such that air-avid treated liberated solid kerogen having a fineness of between about 5 microns to about 250 microns attaches to the rising bubbles of aeration where it collects in the foam;

(f) skimming off the collected liberated solid kerogen from the surface of the first water suspension medium in order to recover liberated solid kerogen having an average fineness of between about 5 microns to 250 microns;

(g) grinding the recovered liberated solid kerogen of step (f) into a second product consisting essentially of generally disassociated inert matter and generaly clean solid kerogen having an average fineness of between about 0.5 microns to about 45 microns;

(h) treating the surface of the second product including the ground-clean solid kerogen with a second collector in order to render the ground-clean solid kerogen air-avid and water-repellent;



(i) introducing the ground-treated second product of step (h) into a second water suspension medium having a second frother;

(j) aerating the second water suspension medium having the second frother of step (i) in order to form a second layer of foam on top of the second water suspension medium such that air-avid treated clean solid kerogen having a fineness of between about 0.5 to 45 microns attaches to the rising bubbles of aeration where it collects in the foam;

(k) skimming off the collected clean solid kerogen product from the surface of the second water suspension medium in order to recover a clean solid kerogen product having an average fineness of between about 0.5 to 45 microns;

(l) mixing the recovered clean solid kerogen product of step (k) with a liquid means to form a pumpable solid kerogen paste;

(m) introducing the pumpable solid kerogen paste of step (k) into at least one reaction zone maintained at a pressure of between about 50 and about 5,000 psi. and a temperature of between about 300 degrees Fahrenheit and about 1,000 degrees Fahrenheit in order to convert the solid kerogen in the pumpable solid kerogen paste into a hydrocarbon liquid; and

(n) removing the converted hydrocarbon liquid of step (m) and associated gases from the reaction zone.

4,576,709

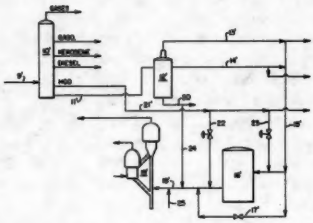
CATALYTIC UPGRADING OF REDUCED CRUDES AND RESIDUAL OILS WITH A COKE SELECTIVE CATALYST

Charles B. Miller, and Roy E. Whitt, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 413,870, Sep. 2, 1982. This application Jun. 8, 1984, Ser. No. 618,635

Int. Cl.[4] C10G *11/05, 69/04*

U.S. Cl. 208—57 **44 Claims**



1. In a process for catalytically converting residual oils comprising metallo-organic compounds boiling above 552° C. (1025° F.) with an active zeolite cracking catalyst comprising a passivating metal added to passivate nickel accumulated on catalyst particles comprising carbonaceous deposits and where the catalyst is regenerated with an oxygen containing gas to produce a CO rich flue gas, the improvement which comprises:

(a) partially hydrogenating a gas oil product of distillation before admixture with a vacuum resid product to provide a hydrogenated gas oil and mixing said hydrogenated gas oil with said vacuum resid product to form a vacuum resid-hydrogenated gas oil mixture;

(b) catalytically cracking the vacuum resid-hydrogenated gas oil mixture with a special catalyst comprising a hydrogen form of faujasite crystalline zeolite comprising rare earths dispersed in a high alumina content acidic matrix material providing cracking activity whereby carbonaceous material is deposited on the catalyst;

(c) regenerating said catalyst by combustion to remove deposited carbonaceous material to a desired residual coke level in the presence of an oxygen lean regeneration gas under a regeneration temperature restricted to within the range of 677° C. (1250° F.) up to about 760° C. (1400° F.);

(d) limiting said regeneration temperature as recited hereinabove and promoting CO burning with oxygen lean gas within a dense fluid bed of catalyst being regenerated;

(e) said catalyst being further restricted to comprise: (1) less than 20 weight percent of said faujasite crystalline zeolite comprising rare earths, (2) said zeolite mixture being dispersed in an acidic siliceous inorganic oxide matrix comprising at least 40 weight percent alumina, (3) said catalyst being prepared under conditions to provide catalyst particles with a surface area greater than 200 sq. m./g. and a pore volume of at least 0.4 c.c./g., and (4) said catalyst comprising rare earth metals also distributed in the catalyst matrix in an amount providing a lanthanum to cerium ratio greater than one.

4,576,710

CATALYST DESULFURIZATION OF PETROLEUM RESIDUA FEEDSTOCKS

Govanon Nongbri, Newtown, Pa., and Michael C. Chervenak, Pennington, N.J., assignors to HRI, Inc., Gibbsboro, N.J.

Continuation of Ser. No. 414,708, Sep. 3, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 672,841

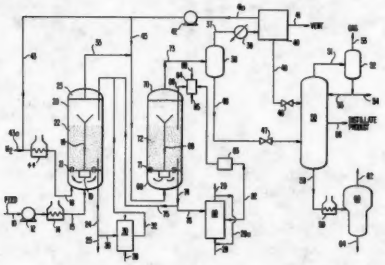
Int. Cl.[4] C10G *65/04, 65/12*

U.S. Cl. 208—58 **12 Claims**

1. A process for the catalytic desulfurization of heavy petro-

leum residua feedstocks containing at least about 2 W% sulfur and less than about 400 ppm total metals to produce lower sulfur liquid products wherein the effective catalyst deactivation is minimized while catalyst age is increased, said process comprising:

(a) feeding the petroleum residua feedstock together with hydrogen into a reaction zone containing an ebullated catalyst bed of high activity desulfurization catalyst, said reaction zone being maintained at a 790°–860° F. temperature and 1000–1800 psig hydrogen partial pressure with a liquid space velocity of 0.2–2.0 $V_f/hr/V_r$ and a catalyst space velocity of 0.02–0.4 barrel/day/pound catalyst to provide at least about 75% desulfurization of the feed and to produce a hydroconverted hydrocarbon material;



(b) withdrawing used catalyst containing carbon deposits from said reaction zone at a rate of at least about 0.4 lb/bbl feed, discarding between 10 and 50 W% of said used catalyst, regenerating the remainder of said used catalyst to remove substantially all carbon deposits, and returning the regenerated catalyst to the reaction zone for further use along with fresh catalyst to minimize the catalyst effective deactivation rate and increase catalyst age; and

(c) withdrawing said hydroconverted hydrocarbon material from said reaction zone, and phase separating and distilling the material to produce gas and lower boiling desulfurized hydrocarbon liquid products.

4,576,711

HYDROCRACKING PROCESS AND CATALYST THEREFOR

John W. Ward, Yorba Linda, Calif., and Timothy L. Carlson, Grand Junction, Colo., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 406,498, Aug. 9, 1982, Pat. No. 4,517,073, which is a continuation-in-part of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Feb. 1, 1985, Ser. No. 697,258

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.⁴ C10G *47/20*

U.S. Cl. 208—111 **23 Claims**

1. In a catalytic hydrocracking process, the improvement comprising contacting a hydrocarbon feedstock with a hydrocracking catalyst under hydrocracking conditions producing a product hydrocarbon of lower average molecular weight than said feedstock with a catalyst comprising an active hydrogenation metal component on a support comprising in admixture a dispersion of silica-alumina in alumina and a crystalline aluminosilicate zeolite having the zeolite Y crystal structure and a silica-to-alumina mole ratio above about 6.0.

4,576,712

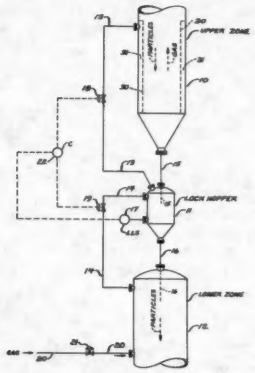
MAINTAINING GAS FLOW DURING TRANSFER OF SOLIDS IN HYDROCARBON CONVERSION AND GAS-SOLID CONTACTING PROCESSES

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 26, 1984, Ser. No. 686,499

Int. Cl.⁴ C10G *9/30, 11/18;* **B01J** *8/08*

U.S. Cl. 208—138 **9 Claims**



1. A method for maintaining a substantially continuous flow of a gas upward through a lower zone and then through an upper zone within a previously established flow rate range while simultaneously transferring particles downward from the upper zone to the lower zone, which lower zone has higher internal pressure than the upper zone, where said upper zone and lower zone internal pressures are independently variable, and where the particles are passed through the upper and lower zones during practice of a process for treatment of the particles or the gas, said method comprising:

(a) passing the gas into the lower zone, whereupon gas passes upward from the lower zone to a lock hopper zone through a lower particle transfer conduit which communicates between the lower zone and the lock hopper zone at a rate which prevents downward flow of particles through the lower particle transfer conduit, where an upper particle transfer conduit communicates between the lock hopper zone and the upper zone, where a lower portion of the upper zone, the upper particle transfer conduit, a lower portion of the lock hooper zone, and the lower particle transfer conduit are filled with particles without discontinuity, and where flow of particles downstream through the upper particle transfer conduit into the lock hopper is prevented because the level of particles in the lock hopper zone is at the lower end region of the upper particles transfer conduit;

(b) simultaneously with step (a), passing gas from the lock hopper zone to the upper zone by means of an upper gas conduit which communicates and substantially equalizes pressure between these zones;

(c) increasing the internal pressure of the lock hopper zone to a value substantially equal to the pressure of the lower zone by stopping gas flow through the upper gas conduit and passing gas from the lower zone to the lock hopper zone by means of a lower gas conduit which communicates and substantially equalizes pressure between these zones, causing particles to flow downward through the lower particle transfer conduit into the lower zone, and causing gas to flow from the lock hopper zone to the upper zone by means of the upper particle transfer conduit, at a gas rate which prevents downward flow of particles through the upper particle transfer conduit; and,

(d) stopping gas flow through the lower gas conduit when

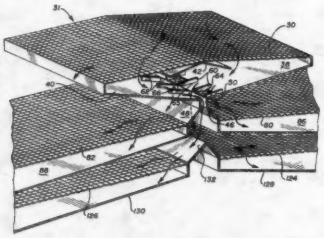
the level of particles in the lock hopper zone falls to a previously determined low level point and simultaneously establishing a flow of gas through the upper gas conduit, causing particle flow out of the lower particle transfer conduit to the lower zone to cease and causing particles to flow out of the upper particle transfer conduit and into the lock hopper zone, said particle flow continuing until the level of particles in the lock hopper zone rises to the lower end region of the upper particle transfer conduit.

4,576,713

FEED STREAM SPLITTER FOR MULTIPLE DECK SCREENING MACHINE

Gerald W. Melin, Stanchfield, Minn., assignor to Carter-Day Company, Minneapolis, Minn.

Filed Jul. 19, 1984, Ser. No. 632,427
Int. Cl.[4] B07B *1/00, 1/28*
U.S. Cl. 209—254 **1 Claim**



1. In a multiple deck screening machine;

(a) a pair of opposed uninterrupted distribution panels mounted in opposed inclined and slightly spaced relation, said panels being mounted for agitated movement to facilitate the movement of particulate material downwardly across their upper surfaces;

(b) said panels being inclined downwardly toward each other and each having opposed and spaced forward lowermost terminal edges located in juxtaposition so that of the other and terminating adjacent the other and defining a divider gap therebetween;

(c) each of said lowermost terminal edges being defined by a plurality of transversely space tongues extending forwardly from the lowermost portions of its panel toward its opposed distribution panel and by an open area between each adjacent pair of its said tongues;

(d) each of said tongues of each of said panels being constructed and arranged to be located opposite one of the open areas of the opposite panel and to deliver particulate material into said divider gap and to deliver particulate material into the opposite open area of the opposite panel if and when said divider gap is filled;

(e) upstanding divider plates extending along opposite sides of each of said tongues on each of said distribution panels from a point located rearwardly thereof and directing defined portions of the particulate material moving down each panel to each of said panel's respective tongues and open areas therebetween; and

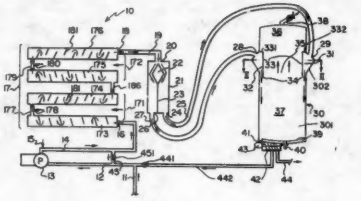
(f) means for maintaining the material directed by said divider plates into said divider gap and said open areas in separated relation.

4,576,714

SYSTEM FOR THE CLARIFICATION OF SEWAGE AND OTHER LIQUID-CONTAINING WASTES

Anton P. Pohoreski, Saskatchewan, Canada, assignor to Continental Manufacturing and Sales Inc., Saskatchewan, Canada

Filed Jun. 15, 1984, Ser. No. 621,236
Claims priority, application Canada, Feb. 3, 1984, 446760
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—195.1 **14 Claims**



1. A sewage purification system comprising:

(a) a pump for drawing sewage into said system;

(b) an injection inlet for injecting a first chemical into the effluent line from said pump; (c) a first U-shaped mixing chamber and a second interconnecting U-shaped mixing chamber, said first and second mixing chambers being connected to said effluent line from said pump, each of said first mixing chamber and said second mixing chamber comprising a near arm and a far arm, the inlet to said mixing chambers being to a near arm of a first said mixing chamber, the outlet from said mixing chambers being from a far arm of a second said mixing chamber, the mixing chambers being interconnected between the far arm of said first mixing chamber and the near arm of said second mixing chamber, each of said near arm and said far arm having baffles therein, said baffles extending only partly across the cross-section of said arm and alternating from one longitudinal face to the opposed longitudinal face and each being inclined at the same angle, towards the direction of flow, to tend to cause turbulent flow, and a conduit interconnecting each said near arm with each said far arm, each said conduit including an injection inlet for the injection thereinto of a respective second chemical and respective third chemical into said respective mixing chambers;

(d) a splitter chamber connected to the common outlet from said mixing chambers to convert said single flow into a pair of parallel flow outlets therefrom;

(e) a separator chamber connected to said parallel flow outlets and having inlet structure therein to cause streams of said chemicallytreated sewage to flow in a unitary direction tengentially along the side walls of said separator chamber, said separator chamber also including means therein for separating sludge therefrom and withdrawing it from the bottom thereof, through a sludge withdrawal line and for withdrawing clean water from the upper central core thereof; and

(f) a sludge recycle line interconnecting said separator chamber and said pump inlet line.

4,576,715

MEMBRANE PACK AND METHOD OF MAKING

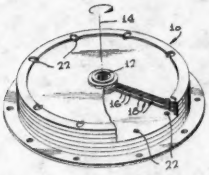
John M. Michaels, Irvine; Gerald A. Croopnick, Trabuco Canyon, and Richard A. Morris, Anaheim, all of Calif., assignors to Dresser Industries, Inc, Dallas, Tex.

Filed Feb. 13, 1981, Ser. No. 234,394
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—347 **10 Claims**

3. A membrane pack with a sealed edge comprising:

a sheet-like carrier which is permeable to the lateral flow of fluid therein, said carrier having an edge;

an insert of substantially nonporous thermoplastic polymer lying in the same plane as the carrier and having a first edge lying against said edge of said carrier but free of interlocking connection therewith, and an opposite second edge forming an edge of the membrane pack; and



a membrane structure lying over a face of said carrier and extending beyond said carrier edge to lie over said insert, said insert being heat welded to the portion of said membrane structure which lies beyond said carrier edge, whereby to seal the carrier against the inflow of fluid therein which passes across said second edge of the insert.

4,576,716

METHOD OF PRODUCING WATER TREATMENT MEDIUM AND MEDIUM PRODUCED THEREBY

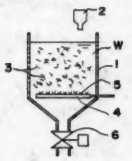
Hiroaki Ida, Uji; Masahiro Fujii, Kyoto, and Toshio Haruta, Nagaokakyo, all of Japan, assignors to Unitika, Ltd., Japan

Continuation-in-part of Ser. No. 331,765, Dec. 17, 1981, abandoned. This application May 9, 1983, Ser. No. 493,433

Claims priority, application Japan, Dec. 27, 1980, 55-186297; Mar. 24, 1981, 56-43332

Int. Cl.⁴ B01D *39/04*

U.S. Cl. 210—496 **15 Claims**



14. A depth-type filtration medium adapted for repeated use by backwash consisting of a spherical or spheroidal or discal fiber lump or lumps of non-crimped fibers obtained by causing non-crimped staple fibers 15 to 30 mm in length to flow and vibrate in a dispersive medium liquid so that the fibers will fold and bend and become mutually intertwined or entangled, said fibers being made of material selected from the group consisting of the polyester family, the polyamide family, the polyvinyl alcohol family, acrylonitrile, rayon, and any combination thereof.

4,576,717

PROCESS FOR DENITRIFYING SUBTERREANEAN WATERS TO MAKE THEM POTABLE

Jean J. Collin; Alain Landreau, both of Orléans; Henri Talbo, Rennes; Guy Martin, Cesson Sevigné , and Jean Morvan, Liffré, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

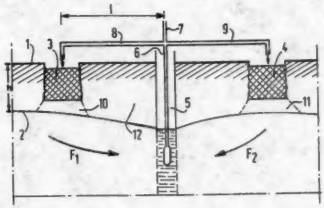
Filed Jul. 31, 1984, Ser. No. 636,396

Claims priority, application France, Aug. 2, 1983, 83 12733

Int. Cl.⁴ C02F *3/06*

U.S. Cl. 210—610 **14 Claims**

1. A process for biological denitrification by a heterotrophic procedure for rendering subterranean water potable, said process comprising: introducing water to be treated into an in situ infiltration site containing a carbonaceous substrate and an inorganic support to denitrify the water to be treated, wherein denitrification is carried out without recourse to artificial enrichment with denitrifying bacteria; passing said denitrified water from said infiltration site to a zone which serves as a



supplementary purification, said zone including means to remove residual organic compounds to produce potable water; and passing said potable water into an aquifer cable thus rendering said aquifer table potable.

4,576,718

USE OF WATER-ABSORBING, HIGHLY-FILLED POLYURETHANE (UREA) COMPOSITIONS FOR BIOLOGICAL TREATMENT OF WASTE-CONTAINING LIQUIDS

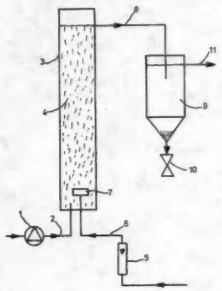
Artur Reischl, Leverkusen, and Kurt Mack, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,441

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402697

Int. Cl.⁴ C02F *3/06, 3/08*

U.S. Cl. 210—616 **15 Claims**



1. In the biological treatment of a wastecontaining liquid by the removal of organic matter by microorganisms, the improvement which comprises adding a carrier material for said microorganisms to said liquid in an amount of at least 0.5 grams per liter of said liquid, said carrier material comprising a non-floating, non-abrasive, filled polyurethane(urea) composition which (i) does not contain any cells capable of growth during the production thereof, (ii) has a filler content of from more than 15% by weight to about 95% by weight, based on the moisture-free weight of the filler-containing polyurethane(urea) composition, and (iii) has a water-absorbability of from more than 33% to about 97% by weight, said fillers used in said composition being selected from the group consisting of (i) natural materials containing finely-divided fossil lignocelluloses and the secondary products thereof, (ii) active carbon, (iii) cork powder, (iv) finely-divided organic distillation residues which melt above 100° C., (v) finely-divided inorganic

fillers, (vi) homogeneous or cellular plastic particles, and (vii) mixtures thereof.

4,576,719

PROCESS FOR THICKENING DIGESTED SLUDGE

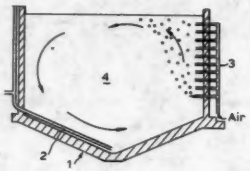
Brian J. E. Hurley, Wickford, and Anthony J. Rachwal, West Molesey, both of England, assignors to Thames Water Authority, London, England

Filed Feb. 28, 1984, Ser. No. 584,454

Claims priority, application United Kingdom, Feb. 28, 1983, 8305446

Int. Cl.⁴ C02F *11/06*

U.S. Cl. 210—620 **7 Claims**



1. A process for thickening digested sludge, comprising:
(i) providing digested sludge at a pH below 8.0 to be thickened;
(ii) providing a source of air;
(iii) passing the air throughout the whole volume of the digested sludge at an intensity in the range of above 0.1 to 5 parts of air to 1.0 part of said sludge, on a volume basis per hour;
(iv) periodically ceasing and restarting said air flow through said sludge;
(v) monitoring the pH of the digested sludge during periods of ceased air flow; and
(vi) ceasing flow of air completely and allowing settlement to thicken the sludge and provide a supernatant fraction and a sludge fraction after obtaining an indication of pH of at least about 8.0.

4,576,720

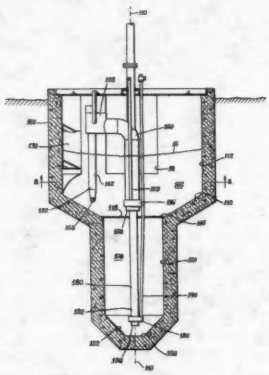
SUBCYCLONIC JET RECIRCULATION GRIT REMOVAL SYSTEM

Mikkel G. Mandt, 2309 Grand Blvd., Cedar Falls, Iowa 50613

Filed May 18, 1984, Ser. No. 611,838

Int. Cl.⁴ C02F *3/22*

U.S. Cl. 210—626 **6 Claims**



1. Apparatus for removing grit from a wastewater stream such as municipal sewage while maintaining the wastewater in an aerobic condition, comprising:
a subcyclonic sedimentation tank which is substantially radially symmetrical about a central axis and having a lower sediment accumulation surface projecting inward from the outer tank wall toward the central axis,
a lower sediment accumulation tank beneath and in axial alignment with the sedimentation tank and in fluid communication therewith along the central vertical axis,
inlet means for tangentially introducing the wastewater inlet stream to be degritted into the subcyclonic sedimentation tank at its periphery,
outlet means for discharging a degritted wastewater stream,
air lift pump means for withdrawing a portion of the wastewater from said sedimentation tank adjacent said sediment accumulation surface at the central vertical axis at a rate of at least about 0.02 of the volume of the wastewater in the sedimentation tank per minute, for introducing into the withdrawn stream at least about 0.1 standard cubic feet of air per gallon of said withdrawn stream for aeration of said withdrawn stream, and for lifting said withdrawn stream within an enclosed conduit under turbulent conditions to an elevation of at least about one foot above the surface of the wastewater in the sedimentation tank to provide an aerated, turbulently mixed recirculation stream,
said air lift pump means comprising an airlift conduit having an intake opening adjacent said sediment accumulation surface, and an air-liquid separation chamber in fluid communication with said airlift conduit above the surface of wastewater in said subcyclonic sedimentation tank for separating said air from said withdrawn stream to provide said aerated recirculation stream, and
discharge means for discharging said aerated turbulently mixed recirculation stream at a velocity of at least about 5 feet per second into the wastewater in the sedimentation tank in the direction of the tangential wastewater influent flow, at one or more locations radially displaced from the central axis.

4,576,721

MISCIBLE POLYMER BLENDS CONTAINING POLY(2-ALKYL-2-OXAZOLINE)

Kathleen M. McCreedy, Midland, Mich.; Henno Keskkula, Austin, Tex.; James C. Pawloski, and Edward H. Yonkers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 552,211, Nov. 15, 1983. This application May 21, 1985, Ser. No. 736,510

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—640 **3 Claims**

1. A process for separating mixtures of 2 or more organic compounds, or a mixture of water and an organic compound miscible therewith, comprising
(a) contacting one side of a membrane comprising a blend of a first polymer of a 2-oxazoline and at least one other polymer which is not a polymer of a 2-oxazoline and which other polymer is miscible with said first polymer in the proportions thereof present in the blend, and in which blend the weight ratio of said first polymer to said other polymer is from about 19:1 to about 1:19 with a fluid feed mixture containing 2 organic compounds of water and an organic compound miscible therewith, and
(b) withdrawing from the other side of said membrane a permeate in vapor form, said permeate containing a higher concentration of one component of the feed mixture than is present in the feed mixture.

4,576,722

SCALE AND SLUDGE COMPOSITIONS FOR AQUEOUS SYSTEMS

Lawrence A. Gaylor, Chagrin Falls, and James W. Beard, University Heights, both of Ohio, assignors to The Mogul Corporation, Chagrin Falls, Ohio

Continuation of Ser. No. 468,771, Feb. 22, 1983, abandoned, which is a continuation of Ser. No. 302,186, Sep. 14, 1981, abandoned, which is a continuation of Ser. No. 121,597, Feb. 14, 1980, abandoned. This application Feb. 7, 1985, Ser. No. 699,220

Int. Cl.⁴ C02F *5/14*

U.S. Cl. 210—699 **3 Claims**

1. A method of inhibiting the deposit of scale and sludge in boiler water which comprises adding to said boiler water

(a) from about 0.01 to 100 parts permillion parts by weight of the water in the boiler of 2-phosphonobutane-1,2,4 tricarboxylic acid or the metal salts thereof, and

(b) from about 0.01 to 500 parts by weight of the water of a mixture of (i) at least one acrylic polymer having an average molecular weight ranging from 1000 to about 10 million selected from the group consisting of homopolymers of acrylic acid and methacrylic acid, and (ii) a sulfonated styrene-maleic anhydride copolymer having a molecular weight such that it is soluble in water and functions as a dispersant,

with the ratio of said acrylic polymer to said sulfonated copolymer in said mixture being such that a given weight concentration of said mixture provides, in combination with said 2-phosphonobutane-1,2,4 tricarboxylic acid compound, an efficacy of inhibition greater than that provided by an equal weight concentration of acrylic polymer above or the sulfonated copolymer above.

4,576,723

ESTIMATION OF THE DEGREE OF DISPERSION IN FLOWING CONCENTRATED DISPERSIONS

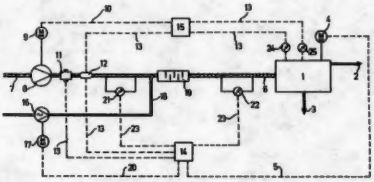
Josef Eisenlauer, Ludwigshafen; Dieter Horn, Heidelberg, and Manfred Neuwirth, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,308

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343598

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—709 **4 Claims**



1. A method for rapid in situ estimation of the degree of dispersion in a flowing two-phase system, in particular for determining optimum metering of a dispersant or flocculant in a concentrated dispersion, wherein assignment of the degree of dispersion is effected by measuring the pressure drop experienced by a flowing dispersion along a defined length during tubular flow.

4,576,724

CYCLONE SEPARATOR

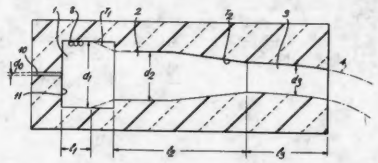
Derek A. Colman, 19 Osprey Close, Lordswood, Southampton SO1 8EX, and Martin T. Thew, 7 Court Close, Bitterne, Southampton SO2 5EJ, both of England

Continuation of Ser. No. 593,270, Mar. 26, 1984, abandoned, and Ser. No. 389,489, Jun. 17, 1982, abandoned. This application Mar. 4, 1985, Ser. No. 707,529

Claims priority, application United Kingdom, Jun. 25, 1981, 8119565

Int. Cl.[4] B01D *37/00, 29/00*

U.S. Cl. 210—788 **18 Claims**



1. A cyclone separator having a generally cylindrical first portion with a plurality of substantially identical substantially equally circumferentially spaced tangentially directed feeds, and, adjacent to the first portion and substantially coaxial therewith, a tapered second portion open at its far end,

the first portion having an axial overflow outlet opposite the second portion,

the second portion comprising a flow-smoothing taper converging towards its said far end, where it leads into

a substantially coaxial generally cylindrical third portion,

the internal diameter of the totality of the axial overflow outlet being d_0, of the first portion being d_1, of the divergent end of the taper comprised in the second portion being d_2, of the convergent end of the taper being d_3, of the third portion being also d_3, the internal length of the first portion being l_1 and of the second portion being l_2, the total cross-sectional area of all the feeds measured at the points of entry normal to the inlet flow being A_i,

the shape of the separator being governed by the following relationships:

$$10 \leqq l_2/d_2 \leqq 25$$

$$0.04 \leqq 4A_i/\pi d_1 \leqq 0.10$$

$$d_2 > d_3$$

$$d_1 > d_2$$

the improvement comprising:

$$d_0/d_2 < 0.1$$

and wherein the half-angle of the convergence of the taper is 20′ to 1°.

4,576,725

MAGNETIC FLUID INCORPORATING FINE MAGNETIC POWDER AND METHOD FOR MAKING THE SAME

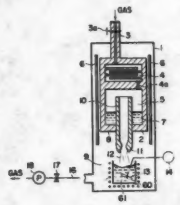
Hirohisa Miura; Hiroshi Satou; Hidenori Katagiri; Toshio Natsume, and Hidekazu Azuma, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 13, 1984, Ser. No. 620,094

Claims priority, application Japan, Jul. 13, 1983, 58-127441

Int. Cl.[4] H01F *1/28;* B22F *9/00*

U.S. Cl. 252—62.51 **11 Claims**



1. A magnetic fluid, comprising a base liquid and metallic magnetic particle with average particle diameter of some hundreds of angstroms dispersed therein, said metallic magnetic particles each being suspended in said base liquid as each being directly generated from a metallic vapor through rapid cooling by adiabiatic expansion of said metallic vapor and thereafter directly introduced into a bath of said base liquid.

4,576,726

MAGNETIC COATING COMPOSITION

Masato Watanabe, Nara, and Yuzo Ozaki, Osaka, both of Japan, assignors to Toyo Tire & Rubber Company Limited, Japan

Filed Jan. 19, 1984, Ser. No. 571,957

Claims priority, application Japan, Jan. 25, 1983, 58-10908; Mar. 24, 1983, 58-50079; Apr. 15, 1983, 58-67646

Int. Cl.[4] C04B *35/04;* H01F *1/00*

U.S. Cl. 252—62.54 **3 Claims**

1. A magnetic coating composition comprising a modified polyurethane resin containing hydroxyl groups at a concentra-

tion of at least 0.1 meq/g and a magnetic powder, wherein said modified polyurethane resin is selected from the group consisting of

(A) a resin obtained by reacting an epoxy-modified polyurethane resin with at least one of an amine or a carboxylic acid;

(B) a resin obtained by reacting a polyurethane resin having a carboxyl group with an epoxy compound;

(C) a resin obtained by reacting an epoxy compound with at least one of an amine or a carboxylic acid to prepare a ring-opened epoxy compound having hydroxyl groups and then reacting said ring-opened epoxy compound with an isocyanate; and

(D) a mixture of a ring-opened epoxy compound having hydroxyl groups, prepared by reacting an epoxy compound with at least one of an amine or a carboxylic acid, and a polyurethane prepared by reacting an isocyanage compound with said ring-opened epoxy compound.

4,576,727

PHOSPHATE-FREE DETERGENT COMPOSITION FOR WASHING OF TEXTILES IN HARD WATER

Gwendolen Browne, Rotterdam, Netherlands, assignor to De-Blaueve Lier B.V., Rotterdam, Netherlands

Division of Ser. No. 493,273, May 10, 1983, Pat. No. 4,534,876. This application Aug. 1, 1984, Ser. No. 636,556

Claims priority, application Netherlands, May 12, 1982, 8201953

Int. Cl.[4] C11D *7/12, 7/42, 17/00;* **C08K** *3/26*

U.S. Cl. 252—90 **7 Claims**

1. A substantially phosphate-free detergent composition for washing of textiles in hard water at a temperature of at most 70° C., wherein are comprised

(a) at least one watersoluble inorganic salt derived from carbon dioxide, inclusive hydrates, perhydrates and percarbonates thereof

(b) at least one acidic compound devoid of formation of a precipitate with calcium and magnesium ions in hard water at usual dosage

(c) at least one surface active compound devoid of formation of a precipitate with calcium and magnesium ions in hard water at usual dosage,

at least one of the components (a) and (b) being physically separated from the other one, the ratio of these components being such that the pH of a 0.5% by weight solution in a washing liquor remains within the range of 5 to 8 throughout the complete washing cycle and said composition essentially free of components that will precipitate in hard water during the washing process.

4,576,728

CLEANING COMPOSITIONS

Barry Stoddart, Gateshead, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 8, 1984, Ser. No. 669,492

Claims priority, application United Kingdom, Nov. 11, 1983, 8330158

Int. Cl.[4] C11D *1/84, 7/54*

U.S. Cl. 252—102 **18 Claims**

1. A thickened aqueous cleaning composition consisting essentially of

(a) from about 0.1% to about 5% by weight of a tertiary amine oxide of formula $R_1R_2R_3N—O$ wherein R_1 is a C_{12}–C_{15} linear and branched alkyl groups and R_2 and R_3 are independently selected from the group consisting of C_1–C_4 alkyl groups and C_2–C_4 hydroxyl alkyl groups;

(b) from about 0.01% to about 1% by weight of a viscosity enhancing compound selected from the group consisting of [salicylic acid and its 5-sulpho and 3,5-dimethyl derivatives,] m- and p-chloro benzoic acid, p-bromobenzoic acid, p-toluic acid and m-nitrobenzoic acid, and mixtures of any of the foregoing;

(c) from 0% to about 25% by weight of an ionisable compound selected from the group consisting of non surface active organic and inorganic compounds;

said composition exhibiting a viscosity of at least about 500 mPa.sec at a shear rate of 10.8 sec^{-1} and a viscosity of no more than about 50 mPa sec at a shear rate of 692 sec^{-1} at 21° C.

4,576,729

LIQUID DISINFECTANT LAUNDRY DETERGENTS

Leon E. Paszek, Mountainside, and Barbara Gebbia, Clifton, both of N.J., assignors to Sterling Drug Inc., New York, N.Y.

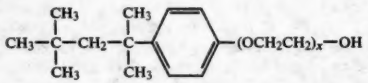
Continuation-in-part of Ser. No. 521,858, Aug. 10, 1983, abandoned. This application Jul. 24, 1984, Ser. No. 633,826

Int. Cl.[4] C11D *3/48, 1/06, 1/86*

U.S. Cl. 252—106 **18 Claims**

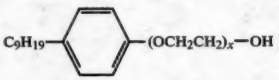
1. A stable liquid laundry detergent concentrate composition, which in use has germicidal, fabric brightening, cleaning, and anti-soil redeposition properties, and composition consisting essentially of:

(A) a non-ionic surfactant having the formulas:



Ia

or



Ib

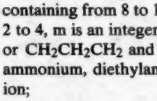
or a mixture thereof in which the C_9H_{19} group in the compounds of formula Ib is a mixture of branched-chain isomers, and x is an integer from 7 to 13;

(B) a cryptoanionic surfactant having the formula:

$$R—O—(C_nH_{2n}O)_m—R_1—COOM \qquad II$$

where R is a long-chain, straight or branched, alkyl group containing from 8 to 18 carbon atoms, n is an integer from 2 to 4, m is an integer from 1 to 100, R_1 is CH_2, CH_2CH_2 or $CH_2CH_2CH_2$ and M is a sodium, potassium, lithium, ammonium, diethylammonium or triethylammonium cation;

(C) a quaternary ammonium germicide having the formula:



III

where R_2 and R_3 are the same or different C_8–C_{12} alkyl, or R_2 is C_{12}–C_{16} and R_3 is benzyl; and X^- is halide; and

(D) water,

wherein, based on the total weight of A, B, C and D, components A, B and C comprise from 30 to 50 weight percent and wherein the ratio of A:B:C in said composition is in the range from 2:4:1 to 3.5:5:1.

4,576,730

METHOD AND COMPOSITION FOR CLEANING AND PROTECTING METAL

Earl Perkins, Columbia, Mo., assignor to Touchstone Corporation, Columbia, Mo.

Filed Mar. 18, 1985, Ser. No. 712,865

Int. Cl.[4] C11D *7/20;* **C23F** *9/00, 13/00;* **C23G** *1/16*

U.S. Cl. 252—174.14 **7 Claims**

1. A powdered composition comprising:

(a) 70 to 99.25% Portland cement,

(b) 0.25 to 10% of anhydrous carbonates or hydroxides of metals selected from Group 1A of the periodic table, and

(c) 0.5 to 20% of silicates of magnesium.

4,576,731

CONVERSION OF INCOMPATIBLE MIXED POLYOLS TO POLYOL PRODUCTS WITH INCREASED RESISTANCE TO PHASE SEPARATION

James N. Rieck, Wheeling, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1983, Ser. No. 458,424
Int. Cl.[4] C09K 3/00
U.S. Cl. 252—182 8 Claims

1. A polyol mixture comprising the reaction product of at least two polyols which normally are incompatible with each other and an organic isocyanate, the isocyanate to hydroxyl equivalent ratio being from 1:4 to 1:35, wherein the mixture is a liquid.

4,576,732

FERROELECTRIC LIQUID CRYSTAL COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS

Masato Isogai; Shintaroo Hattori, both of Hitachi; Kishiroo Iwasaki, Hitachiouta; Teruo Kitamura, Katsuta; Akio Mukoh, Mito; Takashi Inukai, Yokohama; Kenji Furukawa, Yokosuka; Kanetsugu Terashima, and Shinichi Saitoh, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,617
Claims priority, application Japan, Nov. 26, 1982, 57-206106; Dec. 25, 1982, 57-234561; Jul. 29, 1983, 58-137800
Int. Cl.[4] C09K 3/34; G02F 1/13; C07C 69/76, 69/88
U.S. Cl. 252—299.65 12 Claims

1. A ferroelectric liquid crystal compound selected from the group consisting of:

4-n-heptyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-pentyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-hexyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-octyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-nonyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-decyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-undecyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-dodecyloxy-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-hexyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-heptyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-octyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-nonyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-decyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-undecyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
4-n-dodecyl-4'-biphenylcarboxylic acid p'-(2-methylbutoxycarbonyl)phenyl ester,
p-n-pentyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-hexyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-heptyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-octyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-nonyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-decyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-undecyloxybenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-dodecyloxybenzoic acid 4'-(2-methylvbutoxycarbonyl)-4-biphenylyl ester,
p-n-hexylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-heptylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-nonylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-decylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-undecylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
p-n-dodecylbenzoic acid 4'-(2-methylbutoxycarbonyl)-4-biphenylyl ester,
4'-n-decyloxy-4-biphenylyl S-p-(2-methylbutoxycarbonyl)benzoate,
p-n-octyloxybenzyl S-4'-(2-methylbutoxycarbonyl)-4-biphenylyl ether, and
4'-n-octyloxy-4-biphenylyl S-p-(2-methylbutoxycarbonyl)benzyl ether.

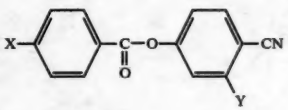
4,576,733

4-HALOGENOBENZOIC ACID ESTERS

Shigeru Sugimori, Fujisawashi; Toyoshiro Isoyama, and Yasuyuki Goto, both of Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jul. 17, 1985, Ser. No. 755,720
Claims priority, application Japan, Jul. 19, 1984, 59-150239
Int. Cl.[4] G09K 3/34; C07C 121/60
U.S. Cl. 252—299.67 4 Claims

1. A 4-halogenobenzoic acid ester expressed by the general formula



wherein X and Y each represent F, Cl or Br.

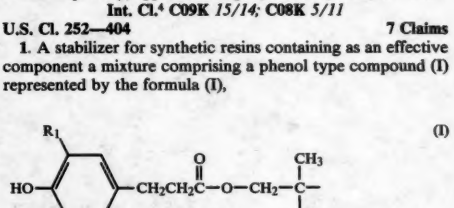
4,576,734

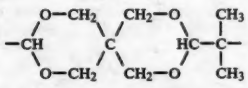
STABILIZER FOR SYNTHETIC RESINS

Tamaki Ishii, Suita; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Masahisa Shionoya, Izumi, and Haruki Okamura, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 15, 1985, Ser. No. 712,230
Claims priority, application Japan, Mar. 19, 1984, 59-53186
Int. Cl.[4] C09K 15/14; C08K 5/11
U.S. Cl. 252—404 7 Claims

1. A stabilizer for synthetic resins containing as an effective component a mixture comprising a phenol type compound (I) represented by the formula (I),





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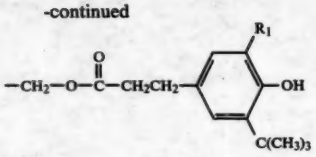
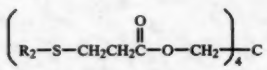
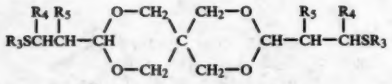


wherein R_1 represents a C_1–C_3 alkyl group, and at least one sulfur type compound (II) selected from the group consisting of compounds represented by the formula (II-1),



(II-1)

wherein R_2 represents a C_4–C_{20} alkyl group, and compounds represented by the formula (II-2),



(II-2)

wherein R_3 represents a C_3–C_{18} alkyl group, and R_4 and R_5 independently represent a hydrogen atom or a C_1–C_6 alkyl group, the weight ratio of phenol type compound (I) to sulfur type one (II) being 1 to 0.5–15.

4,576,735

ELECTROCONDUCTIVE MOLYBDENUM PASTE

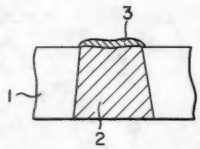
Takashi Kuroki; Tsuyoshi Fujita, both of Yokohama; Gyozo Toda, Hino; Shousaku Ishihara, Kamakura, and Yoshiyuki Ohzawa, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,089

Claims priority, application Japan, Oct. 14, 1983, 58-190900

Int. Cl.[4] H01B *1/02*

U.S. Cl. 252—512 **4 Claims**



1. An electroconductive molybdenum paste which consists essentially of 100 parts by weight of a mixture consisting of 68.0 to 89.2% by weight of molybdenum powders having an average particle size of 0.5 to 10 μm, 10.0 to 27.0% by weight of a solvent, and 0.8 to 5.0% by weight of a binder, 0.5 to 5.0 parts by weight of dibenzylidene-D-sorbitol as a gelling agent, and 0.5 to 4.0 parts by weight of a silane coupling agent selected from the group consisting of at least one of $HSC_3H_6Si(OCH_3)_3$ and $H_2NC_2H_4NHC_3H_6Si(OCH_3)_2$.

4,576,736

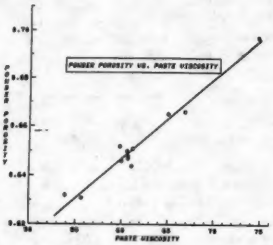
METHOD OF PREDICTING AND CONTROLLING THE VISCOSITY OF CONDUCTIVE PASTES

Ann P. Harmuth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1984, Ser. No. 591,074

Int. Cl.[4] H01B *3/02*

U.S. Cl. 252—512 **3 Claims**



1. A method of formulating conductive metal paste having a predetermined viscosity comprising the steps of:

providing an organic vehicle having a predetermined viscosity;

providing a conductive metal powder having a predetermined average particle size;

developing a directly proportional correlation between packing density of said conductive metal powder and the paste viscosity of a paste of said conductive metal powder, suspended in said organic vehicle,

milling the said conductive powder to make its packing density conform to the packing density necessary to produce said predetermined viscosity of the paste to be formulated as determined by said correlation, and

mixing the organic vehicle and the conductive metal powder having decreased particle packing density.

4,576,737

ENCAPSULATION OF VOLATILE LIQUIDS

Richard S. Johnson, Wirral, England, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 396,373, Jul. 8, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 620,813

Claims priority, application United Kingdom, Jul. 21, 1981, 8122414

Int. Cl.[4] A01K *7/46*

U.S. Cl. 252—522 A **5 Claims**

1. A process for providing a particulate composition comprising liquid perfume encapsulated in a carrier material which comprises preparing a sprayable emulsion of the perfume in a solution of the carrier material, spraying the perfume-containing emulsion into a fluidized bed of particles whereby the perfume encapsulated in carrier material is deposited on the fluidized particles, continuing the spraying of the emulsion into the fluidized bed until the fluidized particles have the desired amount of encapsulated perfume deposited thereon and thereafter collecting the fluidized particles with the perfume encapsulated thereon.

2. Perfume encapsulates prepared by a process as claimed in claim 1.

4,576,738

HARD SURFACE CLEANING COMPOSITIONS CONTAINING PIANANE

Daniel Colodney, and Robert J. Steltenkamp, both of Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,653
Int. Cl.[4] C11D 1/83, 3/44
U.S. Cl. 252—559 12 Claims

1. A clear liquid hard surface cleaner consisting essentially of, by weight, from 2% to 8% of a water-soluble, synthetic anionic sulfated or sulfonated detergent salt having an alkyl group of 8 to 22 carbon atoms in the molecule; from 0.25% to 4% of a water-soluble ethyleneoxylated nonionic detergent; from 1% to 8% cis/trans 2,6,6 trimethylbicyclo(3.1.1)heptane; from 1% to 8% of a nonaqueous, polar, organic solvent having water solubility at 25° C. of at least 20% by weight selected from the group consisting of C_1–C_4 alkyl ethers of ethylene glycol or diethylene glycol or mono-, di- or tripropylene glycol, from 2% to 15% of a water-soluble organic or inorganic alkaline builder salt; from 0.5% to 8% of a C_1–C_3 alkyl-substituted benzene sulfonate hydrotrope salt; and the balance primarily water.

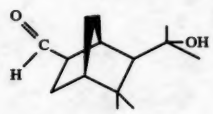
4,576,739

ORGANOLEPTIC TERTIARY HYDROXYL CARBOXALDEHYDES

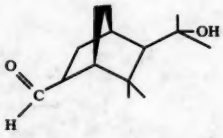
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 511,965, Jul. 8, 1983, Pat. No. 4,491,537.
This application Oct. 1, 1984, Ser. No. 656,660
Int. Cl.[4] A61K 7/46
U.S. Cl. 252—522 R 1 Claim

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising the step of adding to said perfume composition or cologne an aroma augmenting or enhancing quantity of a mixture of compounds having the structures:



and



4,576,740

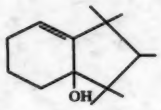
TERTIARY PENTAMETHYLINDANOL DERIVATIVES AND ORGANOLEPTIC USES THEREOF

John B. Hall, Rumson, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

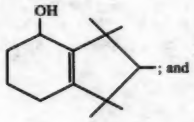
Division of Ser. No. 589,662, Mar. 14, 1984, Pat. No. 4,520,032.
This application Nov. 14, 1984, Ser. No. 671,329
Int. Cl.[4] A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 6 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition or perfumed article or cologne comprising the step of adding to said perfume composition, perfumed article or cologne an aroma augmenting or enhancing quantity of a composition of matter selected from the group consisting of:

(i) the compound having the structure:

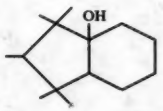


in the absence of the compound having the structure:



; and

(ii) the compound having the structure:



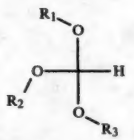
4,576,741

ISOMER-DIRECTED PROCESS FOR PRODUCING ASYMMETRIC KETONES USING CATALYTIC CLAISEN REARRANGEMENT OF ALLYLIC ETHERS, INTERMEDIATES, AND USES OF PRODUCTS AND INTERMEDIATES OF PROCESS IN PERFUMERY

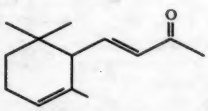
Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; William L. Schreiber, Jackson, and Michael Licciardello, Little Silver, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 602,646, Apr. 20, 1984, Pat. No. 4,548,743. This application Nov. 14, 1984, Ser. No. 671,473
Int. Cl.[4] A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 2 Claims

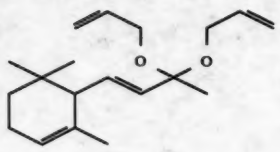
1. A product prepared according to the process comprising the steps of reacting a trialkylorthoformate having the structure:



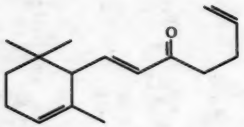
with α-ionone having the structure:

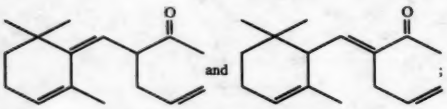


whereby a ketal-containing composition is prepared; then reacting the resulting ketal-containing composition with allyl alcohol in order to form a composition of matter containing the ketal having the structure:

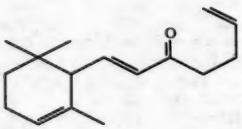


then rearranging the resulting ketal at a pH in the range of from about 2 up to about 6.5 in the presence of a citric acid catalyst thereby forming a mixture comprising the compounds having the structures:

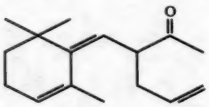




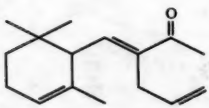
the mole ratio of the compound having the structure;



to the compounds having the structures:



and



being about 48:1, and then fractionally distilling the resulting product at a temperature in the range of from 109°–111° C. and a pressure of 1.0 mm/Hg.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of the product defined according to claim 1.

4,576,742

PERFUME USES OF REACTIVE PRODUCT CONTAINING MONO-OXOMETHYL SUBSTITUTED POLYHYDRODIMETHANONAPHTHALENE DERIVATIVES

Mark A. Sprecker, Sea Bright; Marie R. Hanna, Hazlet; Richard J. Tokarzewski, Keyport; Robert P. Belko, Woodbridge; Hugh Watkins, Lincroft, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

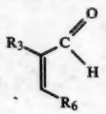
Division of Ser. No. 458,890, Jan. 18, 1983, Pat. No. 4,448,984, which is a division of Ser. No. 354,387, Mar. 2, 1982, Pat. No. 4,391,284. This application Jan. 12, 1984, Ser. No. 570,100

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

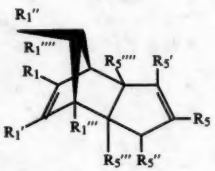
Int. Cl.[4] A61K *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 R **8 Claims**

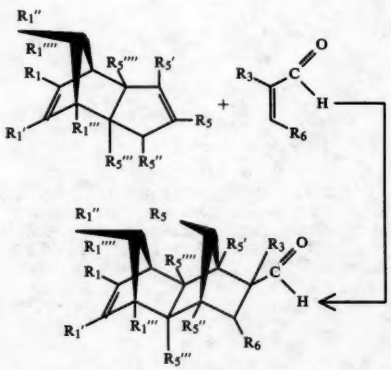
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of a product produced according to the process comprising the steps of (i) admixing at a temperature in the range of 150°–250° C. an acrolein derivative having the structure:



with a bicyclopentadiene derivative having the structure:



whereby the reaction:



takes place wherein R_1, R_1', R_1'', R_1''', R_1'''', R_3, R_5, R_5', R_5'', R_5''', R_5'''' and R_6 represent hydrogen or methyl with the provisos:

(i) at least four of R_1, R_1', R_1'', R_1''', R_1'''' represent hydrogen; and

(ii) at least four of R_5, R_5', R_5'', R_5''', R_5'''' represent hydrogen;

and then (ii) fractionally distilling the resulting product whereby a mixture is produced capable of augmenting or enhancing the aroma of said consumable material.

4,576,743
PLATE CLEANER FOR LITHOGRAPHIC PRINTING PLATE

Nobuyuki Kita, and Hiroshi Matsumoto, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 9, 1985, Ser. No. 690,067
Claims priority, application Japan, Jan. 12, 1984, 59-4016
Int. Cl.[4] B41M *1/06*; B41N *3/06*; C11D *1/62, 3/08*
U.S. Cl. 252—524 **16 Claims**

1. A process for restoring the hydrophilic property of stained non-image areas in a lithographic printing plate, which comprises treating said lithographic printing plate with a plate cleaner, wherein the improvement comprises using a plate cleaner comprising an aqueous solution containing a silicate in an amount of from 0.5 to 20% by weight based on the total weight of the plate cleaner and at least one surface active agent selected from the group consisting of cationic surface active agents and amphoteric surface active agents, said surface active agent being present in an amount of from 0.01 to 10% by weight based on the total weight of the plate cleaner.

6. A process as in claim 1, wherein the surface active agent is an amphoteric surface active agent selected from the group consisting of an alkylbetaine type and an alkylimidazoline type.

4,576,744
DETERGENT COMPOSITIONS

Robert J. Edwards, and Paul D. Hardman, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 20, 1984, Ser. No. 602,575
Claims priority, application United Kingdom, Apr. 29, 1983, 8311854
Int. Cl.[4] C11D *1/14, 3/37*
U.S. Cl. 252—554 **18 Claims**

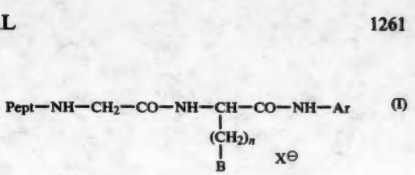
1. A foaming aqueous liquid detergent composition having a viscosity of at least 60 cp to 2000 cp at 25° C., as measured at a shear rate of 26.5 s^{-1}, and consisting essentially of from 2 to 60% by weight of the total composition of an active detergent system comprising a water-soluble salt of a dialkyl ester of sulphosuccinic acid in which the alkyl groups may be the same or different, at least 40% by weight of water, and from 0.5 to 5% by weight of a water-soluble polymer, said polymer being a cellulose ether having hydroxyethyl or hydroxypropyl substituents, said composition being free of quaternary ammonium salts.

4,576,745
METHOD FOR THE FLUORIMETRIC DETERMINATION OF ENDOTOXINS, NEW PEPTIDES CARRYING A FLUOROPHOROUS SUBSTANCE USABLE IN SAID METHOD AND METHOD FOR ITS PREPARATION

Michel Monsigny, Saint-Cyr-en-Val, France, assignor to Centre National de la Recherche Scientifique, Paris, France

PCT No. PCT/FR82/00003, § 371 Date Sep. 9, 1982, § 102(e) Date Sep. 9, 1982, PCT Pub. No. WO82/02382, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 6, 1982, Ser. No. 422,976
Claims priority, application France, Jan. 9, 1981, 81 00261
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R **4 Claims**

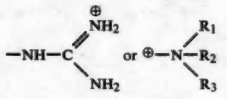
1. Peptides of the formula:



(I)

wherein Pept— is a hydrophobic peptide chain having 1 or 2 amino acid links, —NH—Ar is the residue of 7-amino 4-nitro 2-oxa 1,3-benzodiazole or 3-amino 9-ethyl carbazole

n is equal to 1, 2, 3, 4 or 5 and B is a radical



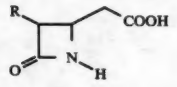
R_1, R_2 and R_3 designating hydrogen atoms or methyl groups.

4,576,746
NOVEL β-LACTAM ACETIC ACID DERIVATIVES

Duccio Favara, Como; Amedeo Omodei-Sale', Voghera, and Pietro Consonni, Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Italy

Filed Mar. 4, 1982, Ser. No. 354,572
Claims priority, application United Kingdom, Mar. 12, 1981, 8107865
Int. Cl.[4] C07D *205/08, 487/04*
U.S. Cl. 260—239 A **4 Claims**

1. A β-lactam acetic acid derivative having the formula



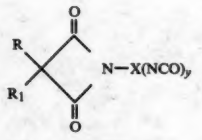
wherein R represents alkyl, mono-substituted alkyl substituted with amino, mono- and di-alkylamino wherein the alkyl group has from 1 to 6 carbon atoms or alkenyl wherein the alkenyl group has from 3 to 6 carbon atoms, and its carboxylic acid salts.

4,576,747
ISOCYANATO-AZETIDINEDIONES

Shenghong A. Dai, Wallingford, Conn., assignor to The Upjohn Company, Midland, Mich.

Filed May 7, 1984, Ser. No. 608,005
Int. Cl.[4] C07D *205/10, 403/14, 403/12*
U.S. Cl. 260—239 A **8 Claims**

1. An isocyanato-azetidinedione having the formula



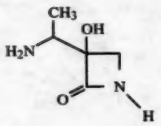
wherein R and R_1, when taken individually, are independently selected from the group consisting of hydrogen and hydrocarbyl of 1–8 carbon atoms, and, R and R_1 when taken together with the carbon atom to which they are attached, represent a cycloalkane residue having 4 to 6 ring carbon atoms, inclusive, y is an integer from 1 to 7, and X is a hydrocarbon radical of 2–36 carbon atoms having a valency of y plus one.

4,576,748
3-HYDROXY-3-AMINOETHYL β-LACTAMS

William J. Greenlee, Teaneck, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 17, 1984, Ser. No. 651,029
Int. Cl.[4] C07D *205/08, 209/48;* A61K *31/395*
U.S. Cl. 260—239 A 3 Claims

1. A compound having the formula



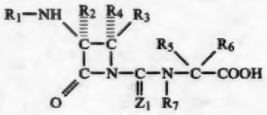
and its pharmaceutically acceptable salts.

4,576,749
3-ACYLAMINO-1-CARBOXYMETHYLAMINOCARBONYL-2-AZETIDINONES

Robert Zahler, Princeton; William H. Koster, East Amwell Township, Hunterdon County, and William A. Slusarchyk, Belle Mead, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 538,719, Oct. 3, 1983, abandoned. This application Apr. 13, 1984, Ser. No. 599,841
Int. Cl.[4] C07D *205/08, 403/12, 401/12;* A61K *31/395*
U.S. Cl. 260—239 A 32 Claims

1. A compound having the formula



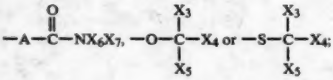
or a pharmaceutically acceptable ester or salt thereof, wherein

Z_1 is oxygen or sulfur;

R_1 is an acyl group derived from a carboxylic acid;

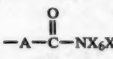
R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxy, $—CH_2X_1$, $—S—X_2$, $—O—X_2$,



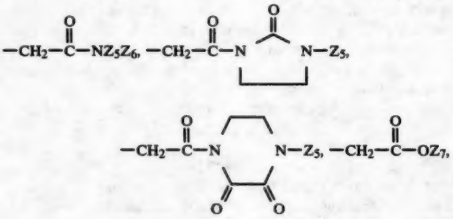
wherein X_1 is azido, amino, hydroxy, carboxy, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano, $—S—X_2$ or $—O—X_2$; X_2 is alkyl, phenyl, or substituted phenyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxy, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $—CH=CH—$, $—(CH_2)_n—$, $—CH_2—O—$, $—CH_2—NH—$, $—CH_2—S—CH_2—$ or $—CH_2—O—CH_2—$; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, or 6-membered nitrogen containing heterocycle;

R_5 and R_6 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, phenyl, substituted phenyl, cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or R_5 and R_6 together with the carbon atom to which they are attached are cycloalkyl, or one of R_5 and R_6 is hydrogen and the other is halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxy, $—CH_2—X_1$, or

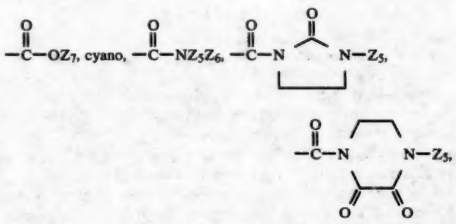


or R_6 is hydrogen and R_5 together with R_7 and the atoms to which they are attached form a 4, 5, or 6-membered nitrogen containing heterocycle; and

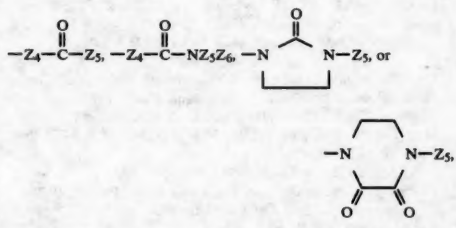
R_7 is hydrogen, alkyl, phenyl, substituted phenyl, cycloalkyl, a 4, 5, 6 or 7-membered heterocycle,



or $—(CH_2)_n—Z_3$ wherein n is 2, 3 or 4 and Z_3 is azido, $—NZ_5Z_6$, halogen, hydroxy,



alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (a 4, 5, 6 or 7-membered heterocycle)—O—, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, alkylsulfonyl,



wherein Z_4 is oxygen, sulfur or

Z_5 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, Z_6 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylcarbonyl, or (substituted phenyl)carbonyl, and Z_7 is hydrogen, alkyl, phenyl or substituted phenyl;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), alkoxy (of 1 to 4 carbon atoms), alkanoyloxy, aminocarbonyl or carboxy groups;

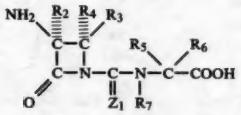
the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl, or one of the above groups substituted with one, or more, oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one, or more, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula $-NZ_8Z_9$ wherein Z_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl and Z_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino;

the expression "a 4, 5, or 6-membered nitrogen containing heterocycle" refers to 1-pyrrolidinyl, Δ^3-pyrrolin-1-yl, 1-azetidinyl, 1-piperidinyl, Δ^3-piperidin-1-yl, Δ^4-piperidein-1-yl, 3-oxazolidinyl, 3-thiazolidinyl, 1-imidazolidinyl, 4-thiomorpholinyl, 4-morpholinyl, 1-piperazinyl, 1-hexahydroopyrimidinyl, tetrahydro-2H-1,3-thiazin-3-yl, tetrahydro-2H-1,3-oxazin-3-yl, 3-thiazolidinyl,-1-oxide, 3-thiazolidinyl,1,1-dioxide, 4-thiomorpholinyl,1-oxide, 4-thiomorpholinyl,1,1-dioxide, tetrahydro-2H-1,3-thiazin-3-yl,1-oxide, tetrahydro-2H-1,3-thiazin-3-yl,1,1-dioxide, or one of the above groups substituted with one, or more, oxo, halogen, hydroxy, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, azido, carboxy, aminocarbonyl, OZ_{10}, NHZ_{10}, or SZ_{10} groups where Z_{10} is alkanoyl, aminocarbonyl, aminosulfonyl, phenylcarbonyl, (substituted phenyl)carbonyl, alkyl, substituted alkyl, phenyl or substituted phenyl.

32. A compound having the formula

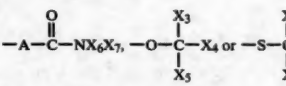


or a salt thereof, or a carboxy protected derivative thereof, wherein

Z_1 is oxygen or sulfur;

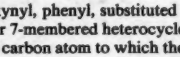
R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxy, $-CH_2X_1$, $-S-X_2$, $-O-X_2$,



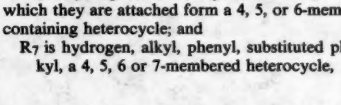
wherein X_1 is azido, amino, hydroxy, carboxy, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano, $-S-X_2$ or $-O-X_2$; X_2 is alkyl, phenyl, or substituted phenyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxy, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $-CH{=}CH-$, $-(CH_2)_n-$, $-CH_2-O-$, $-CH_2-NH-$, $-CH_2-S-CH_2-$ or $-CH_2-O-CH_2-$; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, or 6-membered nitrogen containing heterocycle;

R_5 and R_6 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, phenyl, substituted phenyl, cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or R_5 and R_6 together with the carbon atom to which they are attached are cycloalkyl, or one of R_5 and R_6 is hydrogen and the other is halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxy, $-CH_2-X_1$, or



or R_6 is hydrogen and R_5 together with R_7 and the atoms to which they are attached form a 4, 5, or 6-membered nitrogen containing heterocycle; and

R_7 is hydrogen, alkyl, phenyl, substituted phenyl, cycloalkyl, a 4, 5, 6 or 7-membered heterocycle,



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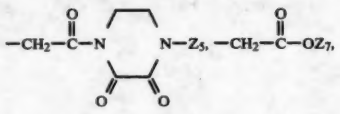
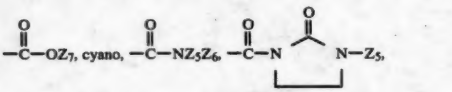
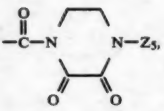
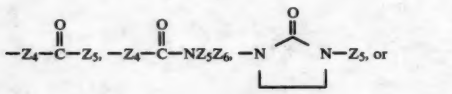


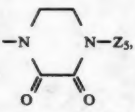
or $-(CH_2)_n-Z_3$ wherein n is 2, 3 or 4 and Z_3 is azido, $-NZ_5Z_6$, halogen, hydroxy,





alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (a 4, 5, 6 or 7-membered heterocycle)—O—, mercapto, alkhylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, alkylsulfonyl,





wherein Z_4 is oxygen, sulfur or

Z_5 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, Z_6 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylcarbonyl, or (substituted phenyl)carbonyl, and Z_7 is hydrogen, alkyl, phenyl or substituted phenyl;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one, or more, azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl (of 1 to 4 carbon atom), alkoxy (of 1 to 4 carbon atoms), alkanoyloxy, aminocarbonyl or carboxy groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl, or one of the above groups substituted with one, or more, oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl, wherein the alkyl groups has 1 to 4 carbon atoms, groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one, or more, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula $-NZ_8Z_9$ wherein Z_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl and Z_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino;

the expression "a 4, 5, or 6-membered nitrogen containing heterocycle" refers to 1-pyrrolidinyl, Δ^3-pyrrolin-1-yl, 1-azetidinyl, 1-piperidinyl, Δ^3-piperidein-1-yl, Δ^4-piperidein-1-yl, 3-oxazolidinyl, 3-thiazolidinyl, 1-imidazolidinyl, 4-thiomorpholinyl, 4-morpholinyl, 1-piperazinyl, 1-hexahydropyrimidinyl, tetrahydro-2H-1,3-thiazin-3-yl, tetrahydro-2H-1,3-oxazin-3-yl, 3-thiazolidinyl,-1-oxide, 3-thiazolidinyl,1,1-dioxide, 4-thiomorpholinyl,1-oxide, 4-thiomorpholinyl,1,1-dioxide, tetrahydro-2H-1,3-thiazin-3-yl,1-oxide, tetrahydro-2H-1,3-thiazin-3-yl,1,1-dioxide, or one of the above groups substituted with one, or more, oxo, halogen, hydroxy, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, azido, carboxy, aminocarbonyl, OZ_{10}, NHZ_{10}, or SZ_{10} groups where Z_{10} is alkanoyl, aminocarbonyl, aminosulfonyl, phenylcarbonyl, (substituted phenyl)carbonyl, alkyl, substituted alkyl, phenyl or substituted phenyl.

4,576,750

TRYPTOPHAN DERIVATIVE

Steven M. Pitzenberger, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

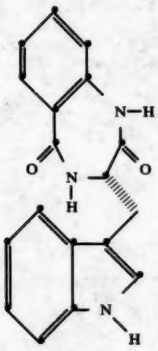
Filed Apr. 22, 1985, Ser. No. 725,884

Int. Cl.[4] **C07D** *403/06*

U.S. Cl. 260—239.3 D **2 Claims**

1. A compound having the formula:

A



4,576,751

β-LACTAMS

Christian N. Hubschwerlen, Durmenach, France, and Gérard Schmid, Kienberg, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

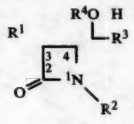
Filed Aug. 11, 1982, Ser. No. 407,027

Claims priority, application Switzerland, Aug. 27, 1981, 5524/81; Jun. 25, 1982, 3925/82

Int. Cl.[4] C07D *205/08, 403/04, 405/04, 405/14*

U.S. Cl. 260—245.4 11 Claims

1. An optically uniform 3,4-cis β-lactam of the formula



wherein R^1 is amino or a group selected from azido, phthalimido, (lower alkyl)—OCO—CH=C(CH_3)—NH or Z—NH wherein Z is selected from t-butoxycarbonyl, trichloroethoxycarbonyl, or benzyloxycarbonyl, R^2 is hydrogen or a compound selected from 2,4 or 3,4-di-(lower alkoxy)-benzyl, 2,4 or 3,4-di-(lower alkoxy)-phenyl, di-[4-(lower alkoxy)-phenyl]-methyl or 4-(lower alkoxy)-phenyl and R^3 and R^4 are joined with one another together with the CHO to which they are attached to form a substituted or unsubstituted 5 or 6 membered heterocycle having two oxygen atom with the proviso that R^1 is Z—NH when R^2 is hydrogen, and the corresponding optical antipodes thereof.

4,576,752

β-SUBSTITUTED POLYFLUOROETHYL COMPOUNDS

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 19, 1982, Ser. No. 399,281

The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.

Int. Cl.[4] C07C *117/00*

U.S. Cl. 260—349 23 Claims

1. The β-substituted polyfluoroethyl compound having the formula,

$$N_3CF_2CFYZ,$$

wherein

Y is —F, —Cl or —OR_F^1;

Z is selected from —C(O)R_FX^1, —CF(R_FX^1)O—$CF(CF_3)CF_2O$—$_nCF(CF_3)COF$, —CF(R_FX^1)O-(-$CF(CF_3)CF_2O$-)$_nCF(CF_3)CO_2M^1$, —CF(R_FX^1)O—$CF(CF_3)CF_2O$—$_nCF$=CF_2, —CF(R_FX^1)O—$CF(CF_3)CF_2O$—$_mCF_2CF$=CF_2, and $Z^1R_FZ^1CFYCF_2N_3$;

R^1 is C_{1-10} alkyl, C_{6-10} aryl or C_{6-10} aralkyl;

R_F^1 is C_{1-4} perfluoroalkyl;

R_F is —CF_2— or C_{2-8} perfluoroalkylene, or C_{2-8} perfluoroalkylene containing one in-chain ether oxygen bond, or two in-chain ether oxygen bonds separated by at least two carbon atoms;

M^1 is an alkali metal, alkaline earth metal or ammonium;

n is 0 to 6;

m is 0 to 7;

Z^1 is —C(O)—, —CF(O—$CF(CF_3)CF_2O$—$_nCF(CF_3)$COF)—, —CF(O—$CF(CF_3)CF_2O$—$_nCF(CF_3)CO_2M^1$)—, —CF(O—$CF(CF_3)CF_2O$—$_nCF$=CF_2)—, or —CF(O—$CF(CF_3)CF_2O$—$_mCF_2CF$=CF_2)—; and

X^1 is —F, —SR^1, —SO_2R^1, —CO_2R, —N_3 or —OR^2;

R is —CH_2CF_3, —$CH_2(CF_2CF_2)_{(1-6)}H$, —C_6H_5 or C_{1-3} alkyl; and

R^2 is —CH_3, —C_2H_5 or —C_6H_5.

4,576,753

AZETIDINONE COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takashi Kamiya, Suita; Masashi Hashimoto, Toyonaka, and Osamu Nakaguti, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

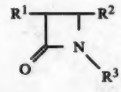
Division of Ser. No. 296,114, Aug. 25, 1981, Pat. No. 4,472,309, which is a division of Ser. No. 71,280, Aug. 30, 1979, Pat. No. 4,304,718, which is a division of Ser. No. 730,012, Oct. 6, 1976, Pat. No. 4,181,800. This application Jul. 9, 1984, Ser. No. 629,216

Claims priority, application United Kingdom, Oct. 6, 1975, 40893; Jan. 2, 1976, 94; Jan. 5, 1976, 242; May 25, 1976, 21507; Jun. 21, 1976, 25746

Int. Cl.[4] C07D *205/08, 403/04, 409/06;* A61K *31/42*

U.S. Cl. 260—239 A 3 Claims

1. A compound of the formula:



wherein

R^1 is amino, azido, phenoxy, phthalimido, 2-hydroxyimino-2-phenylacetamido or a group of the formula: R^d—CONH—, wherein

R^d is phenyl(lower)alkyl, thienyl(lower)alkyl or phenyl(lower)alkoxy,

R^2 is halogen, carboxy, formyl, hydroxymethyl, phenyl, styryl, methylthio, benzyloxyiminomethyl, or 5-methyl-1,3,4-thiadiazol-2-ylthio, and

R^3 is a group of the formula:

wherein

R^4 is phenyl which may be substituted with hydroxy or benzyloxy, and

R^5 is carboxy, lower alkoxycarbonyl or phenyl(lower)alkoxycarbonyl.

4,576,754
PREPARATION OF 6,6-DIBROMO-PENICILLANIC ACID-1,1-DIOXIDE

Jagdish C. Kapur, and Herman P. Fasel, both of Delft, Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Oct. 10, 1984, Ser. No. 659,089

Claims priority, application European Pat. Off., Oct. 18, 1983, 83201496.3

Int. Cl.[4] C07D *499/00*; A61K *31/425*

U.S. Cl. 260—245.2 R 14 Claims

1. In a process for the preparation of 6,6-dibromo-penicillanic acid-1,1-dioxide comprising reacting 6β-amino-penicillanic acid-1,1-dioxide with a nitrosating agent in the presence of bromine and an inorganic acid or strong organic acid, the improvement comprising effecting the reaction in the presence of an alcohol.

4,576,755
WATER-SOLUBLE FIBRE-REACTIVE PHTHALOCYANINE COMPOUNDS

Peter Mischke, Bad Soden am Taunus, and Hermann Fuchs, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

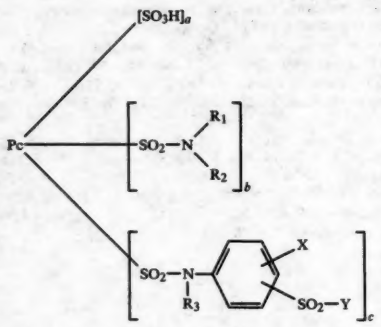
Continuation of Ser. No. 426,194, Sep. 28, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 660,266

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138864

Int. Cl.[4] C09B *47/04, 47/28, 47/30*

U.S. Cl. 260—245.78 3 Claims

1. A water-soluble fiber-reactive phthalocyanine compound of the formula (1)



in which Pc is a radical of metal-free or metal-containing phthalocyanine, with the sulfonic acid or sulfonamide groups being bonded in the 3-positions of the aromatic rings of the phthalocyanine, in which R_1 and R_2 each is hydrogen or alkyl of from 1–6 carbon atoms or said alkyl substituted by methoxy, ethoxy, propoxy, $C_2H_5—O—C_2H_4—O—$, cyano, acetylamino, carboxyl, $HO_3S—$, $H_2O_3P—$, phenyl, methylphenyl, methoxyphenyl, dimethylamino, diethylamino, β-hydroxyethylamino, β-hydroxyethoxy, N-phenylureido, N-alkylureido in which the alkyl is from 1–4 carbon atoms or N-cycloalkylureido, or allyl, 2-methallyl, crotyl or cycloalkyl, or R_1 and R_2, together with the nitrogen atom, are a heterocyclic saturated or unsaturated ring, or R_1 and R_2 are phenyl or said phenyl substitued by one or more methyl, ethyl, methoxy, ethoxy, carboxyl or sulfonic acid groups, R_1 and R_2 being in each case identical or different, in which R_3 is hydrogen or alkyl of from 1 to 4 carbon atoms or said alkyl substituted by hydroxyl or carboxyl groups, in which X is hydrogen or alkyl or alkoxy of from 1 to 4 carbon atoms, in which Y is —CH-2—CH_2—Z in which Z is $—OSO_3H$, $—SSO_3H$, $—OPO_3H_2$, or —OH, a is a number of from 0 to 2, b is a number of from 0 to 2 and c is a number of from 1.7 to 2.6, with the proviso that the sum of a, b and c is at most 4.

4,576,756
PRODUCTION OF HYDROGEN PEROXIDE

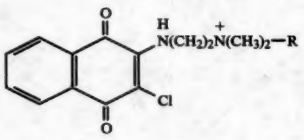
Mark S. Wrighton, Winchester, Mass.; Robert M. Buchanan, Louisville, Ky., and Gary S. Calabrese, Reading, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 543,574, Oct. 19, 1983, Pat. No. 4,533,443. This application Nov. 5, 1984, Ser. No. 668,621

Int. Cl.[4] C07C *50/12*; H01C *13/00*

U.S. Cl. 260—396 R 4 Claims

1. A compound having the formula:



wherein R is a lower alkyl, or aryl group.

4,576,757
PROCESS FOR THE PREPARATION OF MONOACYL POLYALKYLENE POLYAMINES

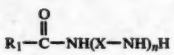
Jacob J. Guth, Upper Black Eddy, Pa.; Elvin R. Lukenbach, Somerset, and Richard R. Tenore, Martinsville, both of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Apr. 26, 1984, Ser. No. 604,267

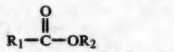
Int. Cl.[4] C07C *102/00*

U.S. Cl. 260—404.5 5 Claims

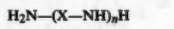
1. A process for the preparation of monoacyl polyalkylene polyamines of the formula



wherein R_1 is straight or branched chain alkyl of from 7 to 21 carbon atoms or mixtures thereof, n is an integer of from 1 to 3 and X is straight or branched chain alkylene or hydroxyalkylene of from 2 to 6 carbon atoms, comprising reacting a fatty acid ester of the formula



wherein R_1 is as above and R_2 is lower alkyl of from 1 to 3 carbon atoms, with a polyalkylene polyamine of the formula



wherein X and n are as above, in the presence of from about 5 to 40% by weight of the total weight of the reaction mixture of a hydroxylic solvent and at a temperature of from about 20° C. to 80° C. or under pressure.

4,576,758
ANTI-INFLAMMATORY LIPOXIN B ANALOGS

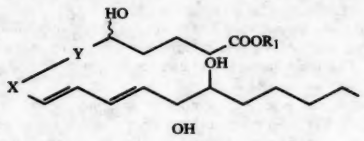
Joel Morris, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 1, 1984, Ser. No. 616,456

Int. Cl.[4] C09F *5/00*

U.S. Cl. 260—405.5 20 Claims

1. An LX-B analog of formula XV



XV

wherein X is cis—CH=CH— or —C≡C—;

wherein Y is cis—C=CH—, trans—CH=CH—, or —CH$_2$—CH(OH)—; and

wherein R_1 is hydrogen; C_1–C_{12} alkyl; C_3–C_{10} cycloalkyl; C_7–C_{12} aralkyl; phenyl optionally substituted by one, two, or three C_1–C_3 alkyl, C_1–C_3 alkoxy, chloro, fluoro, or trifluoromethyl with the proviso that not more than two such substituents are other than alkyl; or a pharmacologically acceptable cation;

with the overall proviso that Y is trans—CH=CH— and X is cis—CH=CH— only when the hydroxyl configuration at C-5 is alpha.

4,576,759

POLYSUBSTITUTED DIENES

Heinz Viehe, Limal; Nadine S. Mesmaeker, Louvain-la-Neuve, and Robert Merènyi, Overijse-Maleizen, all of Belgium, assignors to SOLVAY & Cie (Societe Anonyme), Brussels, Belgium

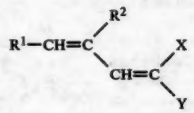
Filed Jun. 20, 1984, Ser. No. 622,745

Claims priority, application Belgium, Jun. 24, 1983, 211063

Int. Cl.^{4} C07C *57/03*

U.S. Cl. 260—410.9 R **14 Claims**

1. A polysubstituted diene of the formula:



in which:

X is selected from the group consisting of SH, SR^3, OR^3, SeR^3, NHR^3 and $N=R^3$, in which R^3 is an aliphatic or cyclic group containing from 1 to 20 carbon atoms;

Y is selected from the group consisting of C≡N and

in which R^4 is hydrogen or an aliphatic or a cyclic group containing form 1 to 20 carbon atoms, provided that, when X is SCH_3, Y is not

and, when X is OR^3 and R^3 is an alkyl group containing at least three carbon atoms, Y is not C≡N;

R^1 is selected from the group consisting of hydrogen, halogen and an aliphatic group containing from 2 to 8 carbon atoms; and

R^2 is selected from the group consisting of hydrogen, halogen, an aliphatic group containing from 1 to 8 carbon atoms and an aromatic group containing from 5 to 8 carbon atoms.

4,576,760

HYDROQUINONE SULFATE DERIVATIVES AND PRODUCTION THEREOF

Isuke Imada, Izumi, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

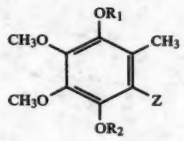
Filed Apr. 27, 1984, Ser. No. 604,495

Claims priority, application Japan, May 2, 1983, 58-77819

Int. Cl.^{4} C07C *141/16*

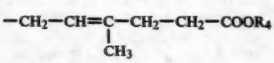
U.S. Cl. 558—37 **8 Claims**

1. A compound of the formula:



wherein either one of R_1 and R_2 is hydrogen or SO_3H and the other is SO_3H, Z is

$-(CH_2)_m-OR_3$, $-(CH_2)_n-COOR_4$ or



where m is an integer of 1–22, n is an integer of 0–21, R_3 is hydrogen or alkanoyl having 2 to 4 carbon atoms, and R_4 is hydrogen or alkyl having 1 to 4 carbon atoms,

or a pharmaceutically acceptable salt thereof.

4,576,761

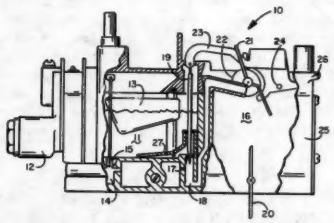
FUEL FLOW DEFLECTOR FOR USE IN A CARBURETOR

David J. Gruenwald, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 9, 1985, Ser. No. 732,112

Int. Cl.^{4} F02M *5/02*

U.S. Cl. 261—23 A **7 Claims**



1. In a carburetor having a float bowl, an inlet valve controlled by a float in said float bowl to maintain a constant fuel level in said float bowl, an induction passage for supplying an air/fuel mixture to an engine, a fuel passageway for supplying fuel from said float bowl to said induction passage, said fuel passageway including an orifice positioned near the bottom of said float bowl, and an axially movable metering rod extending into said orifice to control the effective area of said orifice; the improvement comprising:

a fuel flow directing adaptor having

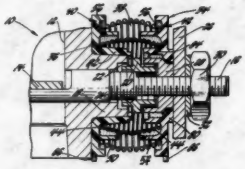
(A) an enclosure placed over said orifice to define a chamber above said orifice, said enclosure including an upper hole closely fitting said metering rod and a bottom open to said orifice, and

(B) a passage connecting said chamber with a portion of said float bowl remote from said orifice.

4,576,762
THROTTLE RETURN SPRING ASSEMBLY

Michael D. Griffin, and Ronald A. Waydelis, both of Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1985, Ser. No. 710,399
Int. Cl.[4] F02M *19/12*
U.S. Cl. 261—65 9 Claims



1. In a throttle body having an induction passage for air flow, a throttle in said passage for controlling air flow therethrough, a shaft projecting from said body, and a lever mounted on said shaft, said lever being effective for moving said throttle between minimum and maximum air flow positions as said lever is moved between closed throttle and open throttle positions, a throttle return spring assembly mounted about said shaft for biasing said lever to said closed throttle position, said throttle return spring assembly comprising:

an inner torsion spring formed as a helical coil disposed about said shaft, said spring having opposite end loops each terminating in an end segment,

an outer torsion spring formed as a helical coil disposed about said inner spring, said outer spring having opposite end loops each terminating in an end segment,

and a pair of spring housings disposed about said shaft at opposite ends of said springs, each spring housing having a portion receiving one of said inner spring end segments, each spring housing further having a boss extending from the perimeter of said housing, each boss having a groove receiving one of said outer spring end segments,

wherein one of said housing bosses engages an abutment formed on said throttle body and the other of said housing bosses engages said lever for biasing said lever to said closed throttle position,

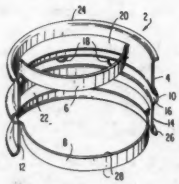
and wherein the outer spring end segment received by said one boss overlies said abutment and the outer spring end segment received by said other boss overlies said lever,

whereby said outer spring can directly engage said abutment and said lever for biasing said lever to said closed throttle position in the absence of said spring housings.

4,576,763
PACKINGS FOR GAS-LIQUID CONTACT APPARATUS

Dale E. Nutter, P.O. Box 7008, Tulsa, Okla. 74105

Filed Jun. 27, 1984, Ser. No. 625,275
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—94 27 Claims



18. A packing element for a bed of packing in gas-liquid contact apparatus, said packing element having a curved base member; said base member having an inner surface, an outer surface, two side edges and two ends;

a bridging member having a curvature which is opposite to the curvature of the base member; said bridging member having an inner surface, an outer surface, two side edges and two ends;

said ends of the bridging member being connected to said base member, said inner surfaces of the base member and bridging member facing inwardly of the packing element in opposite directions, said base member having a channel formed in its inner surface for receiving and conducting a portion of the liquid laterally in the bed when the element is oriented with the inner surface of the base member facing upwardly,

said packing element being made of sheet material which has a rib means therein for stiffening said base and forming said channel, said rib means having a concave surface facing inwardly and a convex surface facing outwardly,

at least one opening extending through the base member from the channel to the outer surface of the base member, said opening being operable to permit liquid to flow from said channel through said opening to wet the outer surface of the base member,

said side edges of the base member having outturned flange means formed therein to deter the flow of liquid over said side edges when the outer surface of the base member is facing upwardly.

20. A packing element for a bed of packing in gas-liquid contact apparatus, said packing element having a curved base member; said base member having an inner surface, an outer surface, two side edges and two ends;

at least two bridging members having curvatures which are opposite to the curvature of the base member; each of said bridging members having an inner surface, an outer surface, two side edges and two ends;

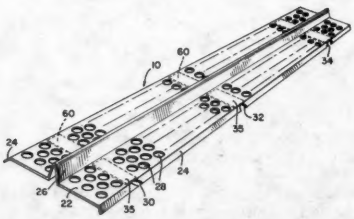
said ends of the bridging members being connected to said base member, said inner surfaces of the base member and bridging members facing inwardly of the packing element in opposite directions, said base member having elongated slots which correspond generally in shape and size with said bridging members, said slot having opposite ends which extend to the ends of the bridging members, a said bridging member having at least one side edge which is nonlinear along the length of the bridging member in order to deter nesting of said bridging member in a slot of another such packing element,

said bridging members extending different distances from the base member.

4,576,764
FILL SLAT ASSEMBLY FOR COOLING TOWERS

G. Maury Shepherd, and Charles E. Shepherd, both of Houston, Tex., assignors to C. E. Shepherd Company, Houston, Tex.

Filed Dec. 31, 1984, Ser. No. 687,973
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—111 12 Claims



1. A fill slat assembly for use in a water cooling tower of the

type having a grid of interconnected vertical and horizontal supporting wires, said fill slat comprising:

(a) a body portion having a plurality of perforations through which water to be cooled can pass or partially pass,

(b) a longitudinal rib extending upwardly from said body portion throughout the length of said slat and located generally centrally transversely of the slat, said rib being unperforated and comprising side walls extending convergingly upwardly relative to a longitudinal central vertical plane through said slat, said rib being open between said side walls and forming a rigidifying beam for the fill slat for absorbing water loading on the slat without deformation thereof,

(c) a laterally directed flange formed at each side of said body portion, said flanges extending downwardly at an acute angle relative to a plane tnrough the body portion of said slat,

(d) each of said flanges being formed with slots open at the outer surfaces of said flanges and closed at the inner ends thereof, said closed ends being spaced from the juncture of said side flanges with said body portion, said slots being of a depth to receive entirely therewithin horizontal and vertical support wires, and

(e) means for positively securing the fill slat in place on the supporting wires so as to reduce rolling or longitudinal movement of said slat relative to said support wires, and reduce the effects of vibration within the tower.

4,576,765

SPHERE/LIQUID SEPARATOR AND SEPARATION METHOD

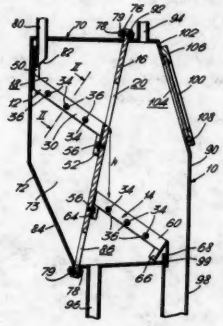
Stephen K. Cowlam; Steven Y. Moss, both of Wantage; Claude L. Stockwell, Newbury, and Victor R. Phillips, Woburn Sands, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 1, 1984, Ser. No. 656,337

Claims priority, application United Kingdom, Oct. 5, 1983, 8326575

Int. Cl.⁴ B01D *29/46*

U.S. Cl. 210—801 **14 Claims**



1. A separator for separating liquid from particles of substantially spherical shape, and comprising a plurality of stationary sloping screening decks in stepped relationship, each screening deck comprising a plurality of members in spaced relationship to each other and extending in the direction of slope of the respective deck, the width d of the space between adjacent members being less than the diameter of the particles, at least some of the members being laminae, and the vertical height H of the laminae being greater than $2\gamma/d\rho g$ where γ, ρ and g are as hereinbefore defined, so that in operation of the separator the particles move down the slope of each screening deck and tumble over the step from one screening deck to the next, while the liquid flows downwardly in the spaces between the members.

4,576,766

PHOTOCHROMIC COMPOUNDS AND THEIR USE IN PHOTOREACTIVE LENSES

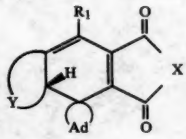
Martin W. Baskerville, Towcester; William R. Maltman, St. Helens, both of England, and Stephen N. Oliver, Penryncock, Wales, assignors to The Plessey Company PLC, Ilford, England

Filed Sep. 7, 1983, Ser. No. 530,160

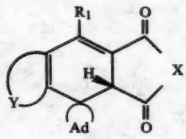
Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.4 **8 Claims**

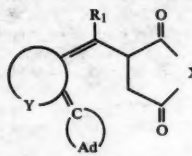
8. A method of forming a photochromic article capable of darkening with presence of sunlight and thermally fading in the absence thereof at ambient temperatures which comprises incorporating a precursor of the general formula (1) set forth in claim 1 into the material from which the article is formed prior to forming and converting it in situ into a material which confers a heliochromic character on the article, said precursor having the property that if heated at a temperature of at least 180° C. or if irradiated with U.V. light it is converted to a compound of general formula (11) below and on continued heating or irradiation undergoes at 1:5 hydrogen shift to a pale-coloured compound of general formula (111) below which pale coloured compound is reversibly converted to a darker compound of general formula (1V) under the stimulation of sunlight



(II)



(III)



(IV)

4,576,767

METHOD FOR CONTROLLING POWDER PRODUCTION

A. David Booz, New Kensington; Daniel R. Barch, Natrona Heights, both of Pa.; Ray A. Kuchera, and David D. White, Jr., both of Rockdale, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 413,512, Aug. 31, 1982, Pat. No. 4,468,182. This application May 3, 1984, Ser. No. 595,616

Int. Cl.⁴ B29B *9/00*

U.S. Cl. 264—12 **9 Claims**

1. An improved method for the production of particulate metal comprising:

(a) providing a containment vessel having a sidewall extending to and endwall;

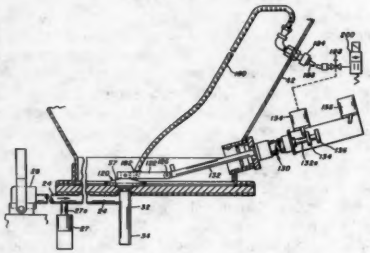
(b) providing a source of molten metal external to said vessel in communication with a nozzle means containing a central bore through which said molten metal flows from said source;

(c) mounting said nozzle means carried by said endwall, said

external source of metal, said sidewall and said endwall cooperating with the nozzle means to seal off the interior of said vessel and the metal particles therein from the area adjacent said source of molten metal;

(d) flowing a source of atomizing gas through said nozzle means into said vessel; and

(e) purging said bore with an external source of purging gas directable into said central bore in a direction opposite to the flow of molten metal therethrough to remove depositions therefrom by:



(1) covering said nozzle means with a cover which is positionable within said vessel over said nozzle means, said cover being connected to said source of purging gas;

(2) shutting off the flow of atomizing gas to said nozzle means; and

(3) flowing said purging gas through said cover into said central bore to thereby clean out any material interfering with the flow of metal through said bore.

4,576,768

METHOD FOR IMPREGNATING AND EMBEDDING ELECTRICAL WINDINGS

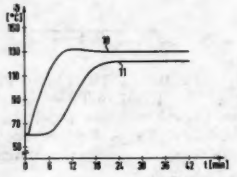
Helmut Markert, Nuremberg; Wolfgang Rogler, Erlangen; Wolfgang Bendel, Leonberg, and Friedrich Alber, Köngen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 624,983

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323154

Int. Cl.[4] B29C *35/02*

U.S. Cl. 264—27 **14 Claims**



1. A method for impregnating and embedding an electrical winding, with a polyepoxide-polyisocyanate resin mixture in the presence of a reaction accelerator which is latent under the processing conditions, which comprises:

(a) drying the resin mixture at a reduced pressure and at a temperature up to 110° C., while stirring, to produce a dried resin mixture;

(b) drying the electrical winding and impregnating the winding with the dried resin mixture under conditions of reduced pressure and a temperature up to 110° C. to produce a cast-in winding;

(c) applying an overpressure above atmospheric to the cast-in winding;

(d) elevating the temperature of the cast-in winding while maintaining said overpressure by generating Joule heat in the winding and, controlling the temperature as a function of the reaction heat to initate a cross-linking reaction of the resin mixture impregnated in the cast-in winding and produce a hardened cast-in winding; and

(e) post-heating the hardened, cast-in winding so that the cross-linked resin mixture is post-hardened.

4,576,769

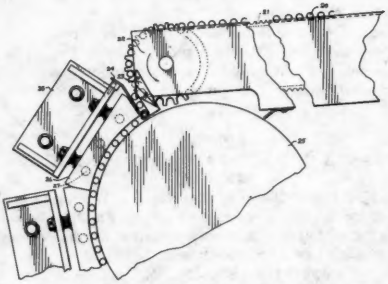
PROCESS FOR EXTRUDING AND SIZING FOAMED THERMOPLASTIC CIGARETTE FILTER RODS

Wyatt P. Hargett, Jr., Matthews, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,635

Int. Cl.[4] B29C *67/22, 59/04*

U.S. Cl. 264—51 **7 Claims**



1. A method of sizing thermoplastic polymeric foamed cigarette filter rods which comprises:

forming a thermoplastic polymeric foamed cigarette filter rod by extrusion through a circular orifice, cutting said rod at a cutting station into sections, each having the length of several filters, conveying said cut sections into the nip formed by a smooth surfaced rotating drum and a plurality of stationary heated block members mounted about and spaced from the periphery of the drum whereby oversized cut sections are rolled and thereby compressed to a uniform circumference.

4,576,770

METHOD OF MANUFACTURING A TURBOMACHINERY ROTOR

Frederick E. Schultz, Exmore, Va., assignor to General Electric Co., Philadelphia, Pa.

Division of Ser. No. 364,211, Apr. 1, 1982, Pat. No. 4,464,097. This application Oct. 19, 1983, Ser. No. 543,277

Int. Cl.[4] B29D *3/02*

U.S. Cl. 264—103 **6 Claims**

1. A method of manufacturing a turbomachinery rotor including disc and blade portions comprising the steps of:

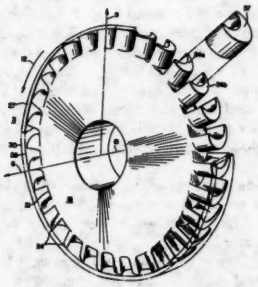
(a) providing a plurality of fiber arrays, each of said arrays being constructed by attaching the outer ends of radial fibers of each array to a ring and extending the inner ends of said fibers radially to a pyrolizable support;

(b) positioning circumferential fibers extending in a circumferential direction among said radial fibers and within a predetermined radial distance from said central support;

(c) positioning axial fibers among said radial fibers and extending said axial fibers in an axial direction within said predetermined radial distance from said central support;

(d) compressing some of said radial fibers into blade group-

ings of predetermined shapes located radially beyond said predetermined distance from said central support;
(e) bonding said fibers in a matrix; and
(f) pyrolizing said pyrolizable support;



Said radial, circumferential, and axial fibers and said matrix consisting of the same material respectively and being selected from the group consisting of carbon, quartz and alumina.

4,576,771

AQUEOUS ISOCYANATE EMULSIONS AND THEIR USE AS BINDERS IN A PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES

Hans-Joachim Scholl, Cologne; Helmut Reiff, Leverkusen, and Hanns I. Sachs, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 150,488, May 16, 1980, Pat. No. 4,528,117. This application Aug. 17, 1984, Ser. No. 641,801
Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921726
Int. Cl.[4] B27N *3/00*; B29J *5/02*; B01J *13/00*; C07C *119/042*
U.S. Cl. 264—109 **8 Claims**

1. A process for producing shaped articles comprising:
(A) introducing into a mold a composition of a comminuted organic and/or inorganic material and an aqueous emulsion as a binder;
(B) hot pressing the composition; and
(C) removing the composition from the mold; wherein the emulsion comprises:
(i) from 80 to 20% by weight, based on the total emulsion, of water;
(ii) from 18 to 79% by weight, based on the total emulsion of an organic polyisocyanate;
(iii) from 0.5 to 15% by weight based on the total emulsion of a sulfonic acid corresponding to the formula:

$$R_1—SO_3H)_n$$

wherein
n represents the integers 1 or 2, and
R_1 represents an aromatic hydrocarbon radical containing from 6 to 14 carbon atoms, an aliphatic hydrocarbon radical containing from 10 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical containing from 6 to 15 carbon atoms, an araliphatic hydrocarbon radical containing from 7 to 15 carbon atoms or an alkaromatic hydrocarbon radical containing from 7 to 24 carbon atoms; and
(iv) optionally from 1 to 10% by weight, based on the polyisocyanate, of a nonionic, surface-active agent as an emulsifier.

4,576,772

CATHETER WITH OPTIMUM RESISTANCE TO BENDING AND METHOD OF MANUFACTURE

George J. Carpenter, Southbridge, Mass., assignor to Warner-Lambert Technologies, Inc., Morris Plains, N.J.

Filed Jul. 20, 1984, Ser. No. 632,940
Int. Cl.[4] B28B *1/48*; B29D *19/08*
U.S. Cl. 264—154 **11 Claims**

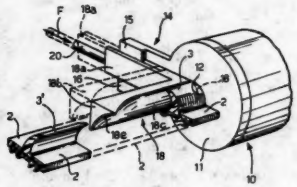
1. A method of controlling resistance to bending in a multi-lumen catheter comprising the steps of
providing a plastic tube of a given hardness, a given resistance to bending and a given length having a plurality of lumens, notching the tube about its periphery and along its length to create voids and to develop a vertabra-like structure, and filling the voids with a vulcanizable polymeric material having a hardness when cured less than the hardness of said plastic tube whereby the resistance to bending of said tube is reduced.

4,576,773

METHOD AND APPARATUS FOR EXTRUDING WEATHER STRIP FOR MOTOR-VEHICLES

Roberto Azzola, Turin, and Luciano Carrera, Cirié , both of Italy, assignors to S.A.I.A.G. S.p.A., Italy

Filed Feb. 3, 1984, Ser. No. 576,653
Claims priority, application Italy, Feb. 3, 1983, 67112 A/83
Int. Cl.[4] B29C *47/02*, *53/04*
U.S. Cl. 264—167 **3 Claims**



1. An extrusion device for extruding a weather strip of elastomeric material having a substantially flat anchoring section and a longitudinally sealing section in the form of a tab coextruded with the anchoring section and connected to the anchoring section along a straight line with the tab being inclined to one side of a plane perpendicular to the anchoring section along said straight line, said extrusion device comprising an extrusion head having a die with a fixed configuration extrusion orifice corresponding to the cross-section of the weather strip to be extruded, moveable deflector means disposed adjacent said extrusion orifice and adapted to be moved into and out of engagement with said tab to selectively change the inclination of said tab relative to said anchoring section from one of said plane to the other side of said plane; said moveable deflector means comprising a deflector member having a deflection surface adapted to contact said tab and having an initial profile at one end thereof corresponding essentially to the profile of one face of said tab as it emerges from said extrusion orifice, a final profile at the opposite end thereof having an inclination different from that of the initial profile and a continuously variable intermediate surface extending from said initial profile to said final profile, and means for mounting said deflector member for movement relative to said extrusion orifice between a rest position in which said deflection surface does not interfere with the weather strip

leaving the extrusion orifice and a working position in which the deflection surface is disposed adjacent said extrusion orifice with said initial profile coinciding with the corresponding portion of said extrusion orifice whereby the tab upon leaving the extrusion orifice slides in contact with the deflection surface and is plastically deformed to gradually assume the final profile of the deflection surface.

2. A method for extruding weather strips of elastomeric material comprises extruding a strip of elastomeric material from a fixed configuration extrusion orifice in an extrusion head having a substantially flat anchoring section and a longitudinal sealing section in the form of a tab connected to the anchoring section along a straight line and inclined relative to said anchoring section on one side of a plane perpendicular to said anchoring section along said straight line and selectively moving a deflector member having a variably contoured deflection surface with an initial profile coinciding with the corresponding portion of said extrusion orifice into engagement with one surface of said tab subsequent to the extrusion of said strip to gradually deflect said tab to change the inclination thereof relative to said anchoring section.

4,576,774

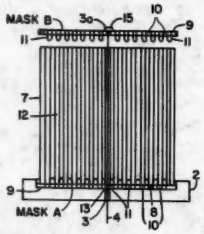
FLEXIBLE MASK AND MEANS FOR APPLYING TO HONEYCOMB STRUCTURES

Gary M. Hazard, Corning; Arthur E. Hillman, Campbell; Max R. Montierth, Elmira, and Albert R. Nieber, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 31, 1984, Ser. No. 615,808

Int. Cl.[4] B28B *1/08*; B29C *33/42*; B32B *3/12*

U.S. Cl. 264—267 **8 Claims**



1. A method for fabricating a selectively-manifolded honeycomb structure for use as a fluid filter comprising the steps:

(a) providing a honeycomb structure having a multiplicity of hollow cells extending therethrough and having a top end face and a bottom end face;

(b) providing a pair of flexible masks, each mask having a pair of opposing faces, a plurality of openings extending through each mask, an opening in the first mask being surrounded with an open head bushing and an opening in the second mask being surrounded with a closed head bushing, said bushings being located in the same position in each mask, and a plurality of protrusions extending from one opposing face of each mask;

(c) placing said first mask having said open head bushing in a fixture closely approximating the outside circumference of said first mask with said protrusions extending away from the base of said fixture;

(d) approximately centering the bottom end face of said honeycomb structure on said first mask;

(e) vibrating said fixture for a sufficient length of time to seat said bottom end face of said honeycomb structure against said first mask such that a subset of cells of said honeycomb structure is aligned with openings in said first mask, and another subset of cells of said honeycomb structure engages an equal number of protrusions of said first mask;

(f) forcing said honeycomb structure down over the protrusions of said first mask,

(g) moving a wire through said open head bushing of said first mask and through the cell of said honeycomb structure directly over said bushing until it protrudes above the top end face of said honeycomb structure;

(h) approximately centering said second mask on the top end face of said honeycomb structure said closed head bushing fitting over the end of said wire protruding from the top end face and said protrusions of said second mask extending toward the top end face of said honeycomb structure;

(i) vibrating said fixture for a sufficient length of time to seat said second mask against the top end face of said honeycomb structure such that the openings of said second mask are aligned with a subset of cells of said honeycomb structure, and the protrusions of said second mask engage another subset of cells of said honeycomb structure, said wire locating said second mask on said honeycomb structure;

(j) forcing said second mask down over the top end face of said honeycomb structure to force the protrusions of said second mask into said subset of cells of said honeycomb structure;

(k) withdrawing said wire through said honeycomb structure and through said open head bushing;

(l) extracting said honeycomb structure with said masks in place from said fixture;

(m) charging a sealant through the openings of said masks into the open ends of said subsets of cells; and

(n) removing said masks from the top and bottom end faces of said honeycomb structures.

4,576,775

PROCESS FOR THE PREPARATION OF INJECTION MOLDED-STRETCH FORMED THERMOPLASTIC RESIN ARTICLES

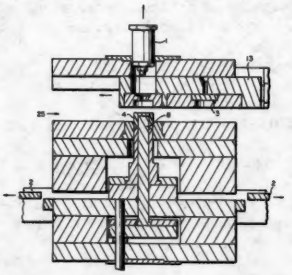
Helmut Kaeufer, Metzkausen, and August Burr, Berlin, both of Fed. Rep. of Germany, assignors to Deutsche Solvay Werke GmbH, Solingen, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 411,294

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133872; Apr. 27, 1982, 3215588

Int. Cl.[4] B30B *7/00*; B29C *45/57, 57/10*

U.S. Cl. 264—323 **13 Claims**



1. A process for the production of a shaped article from a thermoplastic resinous material, comprising the steps of:

heat plastifying the thermoplastic material;

injecting the heat-plastified thermoplastic material into a preform mold cavity in a closed press forming tool having a first shape configuration and at least one parting plane, to form a preform of the thermoplastic material, said preform mold cavity being formed by a preform mold nest and a ram extending thereto, and allowing said preform to partially cool in said preform mold cavity;

opening the press forming tool at said parting plane and providing an at least partially new second shape configuration to the forming tool containing the preform by aligning said preform and said ram with a shaped article

mold nest having a different configuration from said preform mold nest, said ram and said shaped article mold nest forming a second mold cavity, and adjusting said press forming tool to increase the extension of said ram when said press forming tool is reclosed; and

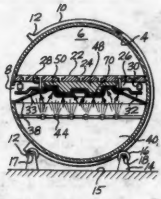
reclosing the press forming tool and subjecting the preform in said second mold cavity of the forming tool having said second shape configuration before said preform is completely cooled to at least one pressure stretching deformation under an elevated pressure of from about 100 N/mm^2 to 800 N/mm^2 generated by a compression device applying a press closing force of from about 50 to 50,000 kN to produce a shaped article.

4,576,776

FLOW FORMING OF COMPOSITE MATERIAL

Marlow C. Anderson, Kent, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Aug. 13, 1984, Ser. No. 639,846
Int. Cl.[4] B29C *43/10*
U.S. Cl. 264—510 **7 Claims**



1. A method of forming into a desired shape composite material that includes a matrix material which is reinforced with a fibrous material and which has a critical cure temperature, comprising:

positioning a mold surface generally above and spaced from and facing a flexible membrane;

heating the membrane to a forming temperature at which the matrix material will flow into the desired shape and which is below the critical cure temperature of the matrix material;

laying the composite material on the membrane, and allowing the matrix material to be heated evenly by contact with the membrane;

when the matrix material has been heated to said forming temperature, applying fluid pressure to the heated membrane opposite the mold surface to force the membrane and the material thereon to move upwardly into contact with and against the mold surface;

while maintaining the fluid pressure, allowing the matrix material to flow and the composite material to take the desired shape; and

then removing the fluid pressure from the membrane to allow the membrane to move out of contact with the composite material.

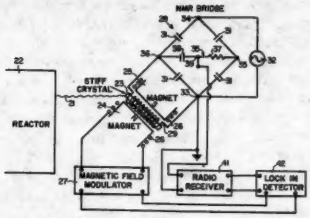
4,576,777

ENERGY DETECTION METHOD AND APPARATUS

Joseph Weber, 9 W. Melrose St., Chevy Chase, Md. 20015

Continuation-in-part of Ser. No. 118,184, Feb. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 833,678, Sep. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 710,295, Jul. 30, 1976, abandoned. This application Aug. 21, 1981, Ser. No. 295,002
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—153 **69 Claims**

1. A method of detecting neutrinos comprising the steps of irradiating a material with the neutrinos to cause coherent stimulated emission of radiant energy fields in the material in



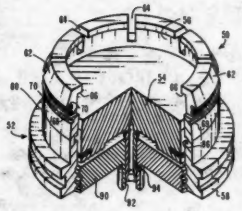
response to the material being irradiated by the neutrinos, and detecting the coherent radiant energy fields.

4,576,778

CORE BARREL PLUG

Herbert E. Ferree, Hempfield Township, Westmoreland County, and Thomas R. Wagner, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1983, Ser. No. 523,995
Int. Cl.[4] G21C *13/06*; F16L *55/12*
U.S. Cl. 376—203 **13 Claims**



1. A nuclear reactor having a core barrel and a plug for preventing flow through a port in said core barrel, said plug comprising:

a substantially cylindrical body formed with a cylindrical portion and a flange and defining a tapered leading open end, said body defining a bore therein extending from said open end to said flange with said bore having a smaller diameter near said open end than near said flange, said cylindrical portion being formed with a plurality of longitudinal slots extending from said open end toward said flange and extending entirely through its thickness;

an end plug attached to said flange and having a second bore therethrough and holes therein extending from said second bore to the outside of said end plug;

a mandrel slidably disposed and captured in said body and having an extension slidably disposed through said second bore with said extension having a channel therethrough for allowing a fluid to pass through said channel and into a space defined between said mandrel and said end plug for moving said mandrel toward said open end of said body when said fluid is introduced into said space thereby causing said cylindrical portion to be expanded, said extension allowing said fluid to pass into said holes when said mandrel is in the expanded and locked position thereby venting said fluid and preventing overexpansion of said plug; and

locking means disposed on said mandrel for locking said mandrel in the expanded position.

8. A plug for preventing flow through a port in a core barrel of a pressurized water nuclear reactor comprising:

a substantially cylindrical body formed with a cylindrical

portion and a flange and defining a tapered leading open end, said body defining a bore therein extending from said open end to said flange with said bore having a smaller diameter near said open end than near said flange, said cylindrical portion being formed with a plurality of longitudinal slots extending from said open end toward said flange and extending entirely through its thickness;

an end plug attached to said flange and having a second bore therethrough and holes therein extending from said second bore to the outside of said end plug;

a mandrel slidably disposed and captured in said body and having an extension slidably disposed through said second bore with said extension having a channel therethrough for allowing a fluid to pass through said channel and into a space defined between said mandrel and said end plug for moving said mandrel toward said open end of said body when said fluid is introduced into said space thereby causing said cylindrical portion to be expanded, said extension allowing said fluid to pass into said holes when said mandrel is in the expanded and locked position thereby venting said fluid and preventing overexpansion of said plug;

a first notch disposed in said mandrel and extending around the outside circumference thereof;

a second notch disposed in said cylindrical portion and extending around the inside circumference thereof; and

a locking ring disposed in said first notch and capable of being inserted in said second notch when said mandrel is moved toward said open end for locking said mandrel in the expanded position.

4,576,779

END CLOSURE MEMBER FOR A CONTAINER

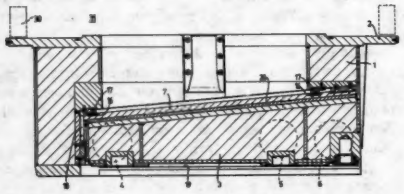
Donald S. McWilliam, Ashton-in-Makerfield, and David Minshall, Warrington, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Oct. 31, 1983, Ser. No. 547,056

Claims priority, application United Kingdom, Nov. 11, 1982, 8232216

Int. Cl.⁴ G21F *5/00*

U.S. Cl. 376—203 **5 Claims**



1. An end closure member for a container comprising, means defining an open end for a container, a wedge-shaped member movable across said end between open and closed positions, a seal plate on the inclined surface of the wedge-shaped member directed towards the interior of said end, means mounting said seal plate for relative movement along the path of the inclined surface of the wedge-shaped member, spring means for urging the seal plate to move to a position to project outwardly beyond the smaller end of the wedge-shaped member, and a stop cooperable with the seal plate such that on advance of the wedge-shaped member into its closed position the projecting seal plate first contacts the stop and continued advance of the wedge-shaped member relative to the stopped seal plate causes a displacement of the seal plate towards the interior of the container to effect a seal at said end, and on withdrawal of the wedge-shaped member toward its open position the seal plate is moved away initially from the end of the container before moving with the wedge-shaped member into the open position.

5. A closure member according to claim 1 in combination with a container which comprises a nuclear fuel transport flask.

4,576,780

RELEASABLE ANTI-EJECTION DEVICE FOR THE CONTROL RODS OF A NUCLEAR REACTOR

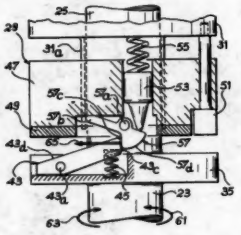
Gérard Belz, Vinon sur Verdon, France, assignor to Commissariat a l'Energie Atomique, France

Filed Apr. 19, 1983, Ser. No. 486,313

Claims priority, application France, Apr. 26, 1982, 82 07139

Int. Cl.⁴ G21C *7/08*

U.S. Cl. 376—235 **6 Claims**



1. In a nuclear reactor comprising a vessel, a core within said vessel and at least one pressure-tight enclosure integral with said vessel, said reactor also comprising at least one command bar pivotedly supported within said enclosure, drive means connected to said command bar, and a control rod connected to said drive means, a motor for rotating said command bar in a first direction for moving said control rod out of said reactor core, said motor also rotating said command bar in a second direction for moving the control rod in the reactor core, an anti-ejection device for said control rod, comprising locking means for rotationally locking said command bar with respect to said enclosure in said first direction, said locking means being supported with respect to said enclosure through calibrated elastic means, said elastic means being operable to flex when a torque exceeding a predetermined value is exerted by said motor on the command bar in said first direction.

4,576,781

TEMPERATURE THRESHOLD DETECTORS

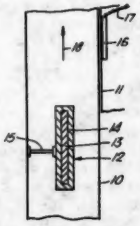
Edward Duncombe, Altrincham, and John P. Winstanley, Lymm, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 2, 1982, Ser. No. 394,879

Claims priority, application United Kingdom, Jul. 28, 1981, 8123184

Int. Cl.⁴ G21C *17/00*; G01K *7/38*

U.S. Cl. 376—247 **10 Claims**



6. A temperature threshold detector system comprising a threshold temperature sensor for transmitting a wireless output

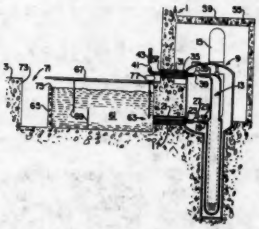
indicative of the existence of a temperature threshold condition, an independently locatable and physically separate detector displaced therefrom and unconnected therewith for detecting the wireless output of said sensor, and means for connecting said detector with a monitoring station, said sensor comprising a permanent magnet having a first Curie point inside a ferromagnetic shield having a second Curie point lower than the first Curie point, said detector being responsive to a change in the field of the magnet as arises when the Curie point of the shield is exceeded.

4,576,782

NUCLEAR REACTOR LOSS OF COOLANT PROTECTION SYSTEM

Robert A. Loose, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1983, Ser. No. 543,599
Int. Cl.⁴ G21C *13/10*
U.S. Cl. 376—282 **15 Claims**



1. In a pressurized water reactor system of a nuclear power plant having a water storage tank for providing emergency coolant water and means provided external to the containment vessel, for use in the event of a primary loss of coolant situation, to circulate emergency water as a coolant by withdrawal through a wall of the containment vessel and return the same back through the wall of the containment vessel and passing the water through a heat exchange means prior to use as a coolant for the reactor core, the improvement comprising:

an enclosure, the interior of which is sealed to the atmosphere, positioned adjacent to and exterior of a wall of the containment vessel;

an inlet conduit, enclosed within a sealed outer casing, communicating between the interior of the containment vessel and the interior of the enclosure;

an exhaust conduit, enclosed within a sealed outer casing, communicating between the interior of the enclosure and the interior of the containment vessel;

a rupture disc on said inlet conduit within said enclosure, such that failure of the exhaust conduit within the enclosure will produce an increase of the pressure within the enclosure and above a predetermined pressure will fracture said rupture disc, and will circulate said coolant within said enclosure; and

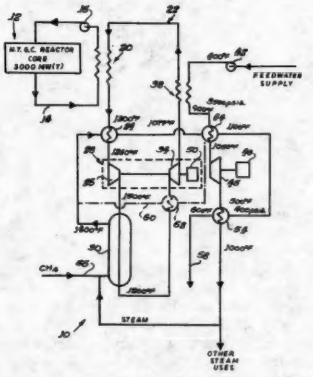
means within the interior of said enclosure for pumping coolant from the interior of the containment vessel through said inlet conduit, and back to the interior of the containment vessel through the exhaust conduit; whereby if either of said conduits should fail, coolant will be collected within the enclosure and sealed to the atmosphere.

4,576,783

HEAT PUMP AUGMENTATION OF NUCLEAR PROCESS HEAT

Stanley L. Koutz, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Continuation of Ser. No. 224,471, Jan. 12, 1981, abandoned. This application Oct. 9, 1984, Ser. No. 659,011
Int. Cl.⁴ G21G *1/02*
U.S. Cl. 376—323 **6 Claims**



1. A system for increasing the temperature of a working fluid heated by a nuclear reactor, said system comprising, in combination,

a high temperature gas cooled nuclear reactor having a core and a primary cooling loop through which a coolant is circulated so as to undergo an increase in temperature,

a closed secondary loop having a working fluid therein,

said cooling and secondary loops having cooperative association with an intermediate heat exchanger adapted to effect transfer of heat from said coolant to said working fluid as said working fluid passes through said intermediate heat exchanger,

a heat pump connected in said secondary loop and including a turbine and a compressor through which said working fluid passes so that said working fluid undergoes an increase in temperature as it passes through said compressor,

a process loop including a process chamber adapted to receive a process fluid therein, said process chamber being connected in circuit with said secondary loop so as to receive said working fluid from said compressor and transfer heat from said working fluid to said process fluid,

a heat exchanger for heating the working fluid connected to the process loop for receiving heat therefrom and for transferring heat to the secondary loop prior to said working fluid passing through said compressor,

said secondary loop being operative to pass said working fluid from said process chamber to said turbine so as to effect driving relation thereof,

a steam generator operatively associated with said secondary loop so as to receive said working fluid from said turbine.

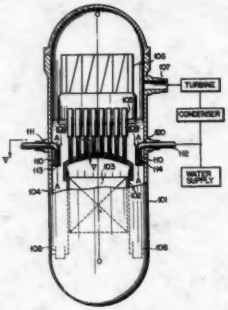
and a steam loop having a feedwater supply and connected in circuit with said steam generator so that feed-water passing through said steam loop is heated by said steam generator, said steam loop being connected in circuit with said process chamber and adapted to pass steam to said process chamber with said process fluid.

4,576,784

WATER SPARGER FOR A BOILING WATER REACTOR

Masahiro Kobayashi, Ebina, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1982, Ser. No. 412,030
Claims priority, application Japan, Aug. 31, 1981, 56-136369
Int. Cl.[4] G21C *15/00*
U.S. Cl. 376—352 6 Claims



1. In a boiling water reactor having a reactor pressure vessel, a shroud disposed in said reactor pressure vessel, a reactor core housed in said shroud, a plurality of reactor water circulators arranged substantially equidistantly on the circumference along the inner surface of said reactor pressure vessel at a level below said reactor core for directing water along a flow path in said reactor pressure vessel from said reactor water circulators through said reactor core to a portion of said reactor pressure vessel above said reactor core and then downwards between said shroud and the inner surface of said reactor pressure vessel to said reactor water circulators, a water sparger for injecting water into a portion of said flow path between said shroud and the inner surface of said reactor pressure vessel, said water sparger comprising:

a plurality of vertically elongated water supplying headers, said plurality of headers being equal in number to said plurality of reactor water circulators, said water supplying headers surrounding said reactor core above said reactor water circulators, each of said water supplying headers being arranged along a vertical plane substantially equidistant from two adjacent said reactor water circulators, a circumferential extent of said headers being limited such that said headers do not extend to vertical radial planes intersecting said adjacent circulators, each of said water supplying headers having thereon one or more vertical rows of apertures directed radially inwardly to said reactor core, said vertical rows being fewer in number than the number of said apertures in each vertical row.

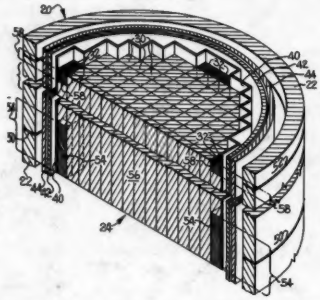
4,576,785

REDUCTION IN RATE OF RADIATION EXPOSURE TO EXCORE NUCLEAR REACTOR COMPONENTS

Talmage B. Clements, and Thomas M. Dresser, both of Raleigh, N.C., assignors to Carolina Power and Light Company, Raleigh, N.C.

Filed Jun. 14, 1983, Ser. No. 504,248
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—435 34 Claims

1. A nuclear reactor including a reactor core having a plurality of individually replaceable fuel assemblies, said reactor further including an excore component such as a weld, instrumentation, or the like, that defines a localized area requiring a low rate of radiation exposure, the location and geometry of said localized area serving to define certain peripheral portions of said core that are in close proximity to the localized area and provide the greatest potential radiation source to the localized area, said core peripheral portions being formed by a partial volume between about 4% to about 50% of the total volume of each of one or more selected fuel assemblies, the partial volume of each selected fuel assembly defining a shield zone including material of lower fissile concentration than that which is typical for the entire core, and a substantial part of the remaining volume of each selected fuel assembly defining a



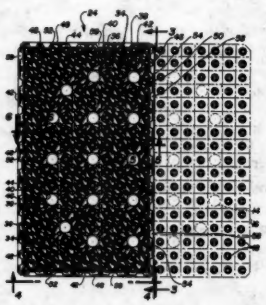
fuel zone including material of higher fissile concentration than in the shield zone, whereby each selected fuel assembly serves as a composite assembly that reduces the rate of radiation exposure to said localized area while also contributing to production of power by the core by providing fissile material for fission reactions.

4,576,786

PARTIAL GRID FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Edmund E. DeMario, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,049
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—439 7 Claims



1. A fuel assembly for a nuclear reactor comprising:

(a) a plurality of elongated fuel rods disposed in a generally parallel upstanding array;

(b) a number of longitudinally extending control rod guide thimbles strategically arranged within the fuel rod array;

(c) a plurality of transversely extending fuel rod support grids axially spaced along and mounted to said guide thimbles, said support grids being of an egg-crate configuration having openings therein through which all of said fuel rods and guide thimbles extend for imparting lateral support thereto such that said grids encompass all of said fuel rods and guide thimbles;

(d) a partial grid structure transversely disposed between an adjacent pair of said fuel rod support grids and mounted

on selected ones of said guide thimbles, said partial grid structure being of an egg-crate configuration having openings therein through which extend respective ones of a group of said fuel rods defined by a predetermined number of said plurality of fuel rods being less than the total number of said fuel rods, said partial grid structure encompassing less than all of said fuel rods; and

(e) means disposed adjacent opposite ends of said fuel rods and guide thimbles for separately supporting the respective opposite ends of said guide thimbles in thereby providing an integral fuel assembly.

4,576,787

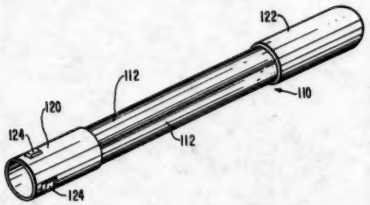
BURNABLE ABSORBER ASSEMBLY

Brian H. Alsop, Penn Township, Westmoreland County; Frank D. Popa, and William E. Edwards, both of Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,048

Int. Cl.[4] G21C *3/32*

U.S. Cl. 376—447 **22 Claims**



1. A burnable absorber assembly for insertion within a tube of a nuclear reactor core having a fluid flowing therein, said assembly comprising a plurality of elements each containing burnable absorber material, each of said elements having an opening extending therethrough, said elements arranged adjacent one another in a cluster so that the openings within said elements form a plurality of longitudinal extending channels through said assembly, said cluster of said elements insertable as a unit within said tube of said reactor core whereby a fluid flowing through said tube passes through each of said channels formed by said elements.

4,576,788

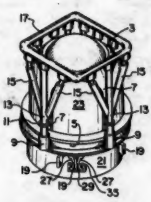
STRADDLE-TYPE SUPPORT STRUCTURE FOR NUCLEAR POWER PLANT PRESSURIZER VALVES

Ronald M. Blaushild, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,074

Int. Cl.[4] G21C *13/00*

U.S. Cl. 376—461 **8 Claims**



1. A support structure for supporting a pressurizer safety and relief valve system of a pressurized water reactor, said system being mounted on columnar supports above a pressurizer vessel, the dome of said pressurizer vessel having a top portion of a smaller diameter than the bottom portion thereof, comprising:

an upper ring section adapted to rest on the top portion of said pressurizer vessel dome;

a lower ring section adapted to encircle the pressurizer vessel side wall at a location adjacent the bottom portion of said pressurizer vessel dome;

a plurality of arcuate connecting sections extending between said upper and lower ring sections, and conforming to the shape of said pressurizer vessel dome;

a plurality of sleeves attached to said lower ring adjacent said arcuate connecting section; and

means for supporting the columnar supports of said pressurizer safety and relief valve system within said sleeves.

4,576,789

GRAIN-REFINED GOLD-FREE DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 570,628, Jan. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 554,721, Nov. 17, 1983, abandoned, which is a continuation of Ser. No. 458,993, Jan. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 400,481, Jul. 21, 1982, Pat. No. 4,419,325. This application Dec. 26, 1984, Ser. No. 685,914

Int. Cl.[4] C22C *5/04*

U.S. Cl. 420—464 **16 Claims**

1. A grain-refined, palladium-based dental alloy for porcelain-fused-to-metal restorations consisting essentially of, on a weight basis, about 70–85% palladium, 7–15% copper, 2–8% gallium, 2–15% indium, 0.2–3.0% ruthenium or rhenium, and an effective amount of boron up to about 0.15% and an effective amount of zinc up to about 0.5% for the purpose of essentially eliminating the formation of bubbles in the porcelain during the porcelain firing process, the total of the constituents being 100%.

4,576,790

LOW GOLD DENTAL ALLOYS

Josef Rothaut, Fort Lee, N.J.; Jürgen Hausselt, Langenselbold, Fed. Rep. of Germany; Rudi Steinke, and Angela Klaus, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,814

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406711

Int. Cl.[4] C22C *5/04*

U.S. Cl. 420—464 **8 Claims**

1. A low gold dental alloy, especially suitable for firing on dental porcelain consisting of 20 to 35 wt.% gold, 45 to 65 wt.% palladium and

(a) 6 to 15 wt.% copper and 0 to 10 wt.% nickel,

(b) 0 to 12 wt.% indium, 0 to 12 wt.% tin, and 0 to 4 wt.% gallium, with the proviso that the sum of the content of indium and tin added to two and one-half times the gallium content has a value between 5 and 15 wt.%,

(c) 0.1 to 1 wt.% of at least one of iridium, rhenium, and ruthenium, and

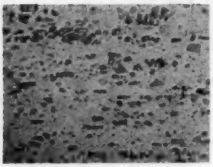
(d) 0 to 1 wt.% aluminum, 0 to 1 wt.% tantalum, 0 to 1 wt.% titanium, and 0 to 5 wt.% silver.

4,576,791

ALUMINIUM-STRONTIUM-TITANIUM-BORON MASTER ALLOY

Stuart R. Thistlethwaite, Widnes, England, assignor to Anglo Blackwells Limited, England

Filed Feb. 27, 1984, Ser. No. 583,940
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—552 7 Claims



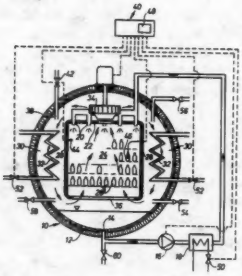
1. A master alloy for modifying the eutectic phase of an aluminium-silicon eutectic or hypo-eutectic casting alloy, or for treating an Al-Si-Mg extrusion alloy and consisting essentially of, in weight percent: 4–20% strontium, 0.2–5% titanium, boron in an amount up to 1%, the balance being aluminium and impurities.

4,576,792

METHOD FOR HEAT TREATMENT OF ARTICLES AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Karl I. M. Martensson, Slöinge, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 17, 1984, Ser. No. 650,847
Claims priority, application Sweden, Sep. 23, 1983, 8305139
Int. Cl.[4] A61L *2/08*
U.S. Cl. 422—27 7 Claims



1. Method for heat treatment of articles (26) which are placed in a chamber (24) in a pressure vessel (10), heat being supplied to and heat being removed from, respectively, the articles (26) via water circulated in a closed circulation circuit (14,16,18, 20) and sprayed over the articles, which water during a heating period is heated by steam being introduced into the vessel and during a cooling period cooled by a first heat exchanger (18) in the circulation circuit, characterized in that simultaneously as the water is sprayed over the articles and flows downwards through them gaseous medium in the vessel is forced to flow upwards through the articles.

4. Arrangement for heat treatment of articles (26) which are placed in a chamber (24) in a pressure vessel for carrying out the method according to claim 1 and comprising a closed circulation circuit for water including a bottom outlet (14) in the pressure vessel, a pump (16), a first heat exchanger (18) and nozzles (20) which spray water over the articles in the chamber, and means (42) for supplying steam to the vessel, characterized in that an impeller (34) is arranged in the vessel for generating a forced circulating flow of gaseous medium through the articles (26) in countercurrent to the water flowing downwards through the articles (26) and that means (40) are arranged for driving the impeller (34) and the pump (16) simultaneously.

4,576,793

ANALYTICAL ELEMENT

Mikio Koyama; Kenichiro Okaniwa, and Masakuni Saruhashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,681
Claims priority, application Japan, Sep. 7, 1982, 57-156084
Int. Cl.[4] G01N *21/78*
U.S. Cl. 422—56 17 Claims

1. An analytical element comprising a support layer having an upper side and a lower side, a reagent layer which is positioned on one of said sides of said support and contains a reagent reactive with a component in a fluid sample, and a porous spreading layer which is positioned on the reagent layer on the opposite side to said support for permitting the component in said fluid sample to permeate into said reagent layer; wherein at least one of said layers contains at least 5% by weight of a copolymer formed by the polymerization of (i) at least 45% by weight of a copolymerizable ethylenically unsaturated acid with (ii) a copolymerizable ethylenically unsaturated monomer other than said copolymerizable ethylenically unsaturated acid.

4,576,794

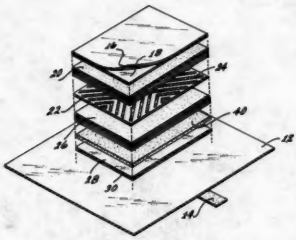
Patent Not Issued For This Number

4,576,795

DISPOSABLE STERILIZER VACUUM TEST PACK

Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 536,798, Sep. 28, 1983. This application Apr. 30, 1984, Ser. No. 605,084
Int. Cl.[4] G01N *21/78*
U.S. Cl. 422—58 8 Claims



1. A method for constructing a disposable sterilizer vacuum test pack comprising the steps of:

a. stacking a plurality of selectively porous layers to create a bundle having a top surface and a bottom surface and an edge therebetween;

b. interposing a sheet with a steam sensitive indicator ink printed thereon between layers of said bundle;

c. positioning a foam layer against said top surface of said bundle to substantially align its edge with the edge of said bundle to permit the circulation of gas over said top surface;

d. positioning a first nonporous gas impermeable layer against said foam layer opposite said bundle to direct the passage of air through the edge of said foam layer;

e. positioning a second nonporous gas impermeable layer against said bottom surface of said bundle to block the passage of air therethrough and aligning said second layer to sufficiently expose the edges of said bundle and said foam layer for evacuation of air therefrom in a preselected partial vacuum and to permit subsequent replacement thereof with steam for exposure of the indicator ink on said sheet to indicate the efficiency of the sterilizer; and

f. folding a porous overwrap around the combination of said bundle, said indicator sheet, said foam layer and said first and second nonporous layers to maintain the integrity thereof.

2. A disposable pack for testing the efficiency of a steam sterilizer apparatus to create a vacuum which comprises:

a selectively porous bundle constructed of a plurality of selectively porous layers wherein said bundle has a top surface and a bottom surface with an edge therebetween;

a sheet with a steam sensitive indicator ink printed thereon interposed between layers of said bundle;

a first foam layer positioned against said top surface of said bundle having an edge substantially aligned with the edge of said bundle to permit circulation of gas over said top surface;

a first nonporous gas impermeable layer positioned against said foam layer opposite said bundle to direct the passage of air through the edge of said foam layer; and

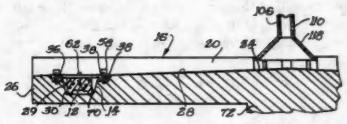
a second nonporous gas impermeable layer positioned against said bottom surface of said handle to block the passage of air therethrough and aligned to leave sufficient exposure at the edges of said bundle and said foam layer for evacuation of air therefrom in a preselected partial vacuum and to permit subsequent replacement thereof with steam for exposure of the indicator ink on said sheet to indicate the efficiency of the sterilizer.

4,576,796

CENTRIFUGAL TISSUE PROCESSOR

James B. McCormick, Chicago, Ill., assignor to Pelam, Inc., Chicago, Ill.

Filed Jan. 18, 1984, Ser. No. 572,168
Int. Cl.[4] G01N *1/06, 1/28, 33/48*
U.S. Cl. 422—99 14 Claims



1. Apparatus for processing and embedding tissue samples comprising

rotor means having a rotational axis and a plurality of well means outward of its rotational axis for holding tissue samples,

means to successively supply processing liquids and liquid embedding material to said well means,

means to intermittently rotate said rotor means at a sufficient speed to slough liquid from said well means, and

well cover means which retain said tissue samples in said well means while accessing processing liquids and embedding liquids to said well means, said well cover means comprising a peripheral frame defining a fluid passage opening and a porous mesh spanning said opening.

4,576,797

VAPOR SOURCE HOLDING CONTAINER

Akira Nishiwaki; Yasuo Morohoshi; Hitoshi Mitake, all of Hachioji; Hiroyuki Moriguchi, Kofu; Hiroyuki Nomori, Hachioji, and Kunio Ito, Tama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Aug. 30, 1983, Ser. No. 527,667
Claims priority, application Japan, Sep. 4, 1982, 57-154236
Int. Cl.[4] C03B *25/14*
U.S. Cl. 422—102 15 Claims

1. A vapor source holding container for the evaporation, by heating, of an evaporative material in said container, said container comprising:

an opening smaller in size than the surface area of said evaporative material, a first wall portion at the bottom of said container which is in contact with said evaporative material, and

a second wall portion, connected to said first wall portion and said opening, wherein said second wall portion is not in contact with said evaporative material, wherein the emissivity of at least the external surface of the first wall

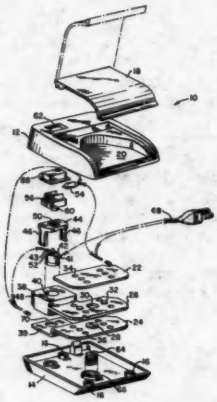
portion of said container in contact with the material is lower than the emissivity of at least the external surface of the second wall portion that is not in contact with the material.

4,576,798

CONTACT LENS DISINFECTING UNIT

Henry B. Hall, Madison; Peter B. Hewes, Middlefield; Benjamin N. Moore, Haddam, and Rosario Sanzaro, Durham, all of Conn., assignors to Safeway Products, Inc., Middletown, Conn.

Filed Jun. 21, 1983, Ser. No. 506,312
Int. Cl.[4] A61L *2/18*
U.S. Cl. 422—105 7 Claims



1. A disinfecting unit for contact lenses including:

(a) housing defining a cavity for receiving lens to be disinfected;

(b) heating system means disposed internally of said housing for generating, storing and transferring heat to said cavity, said heating system means including:

(i) heat generating means;

(ii) thermostat means for controlling the delivery of supply power to said heating system;

(iii) an generally planar insulation member having first and second portions, said first portion having an opening for receiving said heat generating means, said second portion being integral with and extending from first portion and being of greater thickness than first portion and in heat conducting relationship with said thermostat means;

(iv) first and second electrically conductive electrode plates disposed on opposite outer surfaces of said insulation member electrically contacting said heat generating means; said first electrode plate being substantially coextensive with said first portion of said insulating member and in heat conductive contact therewith and said housing portion defining said cavity, said second electrode plate being disposed in heat exchange contact on an outer surface of both the first portion and the second portion of said insulation member for transferring heat from heat generating means to said thermostat means; and

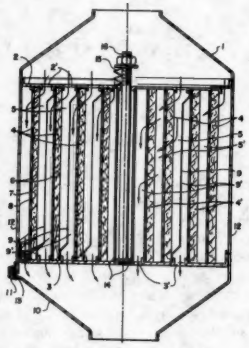
(c) circuit means for supplying power to and effectively controlling said heating system, said circuit means including said electrode plates in circuit with said thermostat means and said heat generating means thereby to de-energize said heater generating means when said thermostat means reaches a preset temperature.

4,576,799

FILTERING AND POST-COMBUSTION DEVICE FOR WASTE GASES

Siegfried Wörner, Esslingen; Walter Öttle, Faurndau, and Herbert Klein, Altbach, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,033
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228325
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—176 9 Claims



1. A filtering and post-combustion device for cleaning soot from waste gases of an internal combustion engine, comprising a housing having one frusto-conical shaped end with an inlet and an opposite frusto-conical shaped end with an outlet which is axially spaced from said inlet, axially spaced inlet and outlet end plates arranged within said housing having means defining a plurality of respective axially aligned inlet and outlet openings therethrough, a plurality of hollow cylindrical filtering elements of different diameters arranged coaxially and at equal radial distances one within the other and within said housing between said end plates, each filtering element including a central gas permeable, axially extending filter and perforated wall means holding said filter in an arrangement permitting radial flow through said filter, and an axially extending wall extending midway between a first radial side of at least one of said filters to an opposite second radial side of a next adjacent filter and from a first axial end of said one filter to an opposite second axial end of said next adjacent filter, said wall defining an annular inlet chamber on said first radial side thereof which communicates with at least one of said inlet openings and an annular outlet chamber on said second radial side thereof which communicates with at least one of said outlet openings which is not axially aligned with said at least one inlet opening so as to further define a flow path from said inlet opening to said inlet chamber and through said filter to said outlet chamber and to said outlet opening, said filter comprising a wire mesh or ceramic fiber material permeable to gas for filtering soot, said perforated wall means comprising a perforated retaining shell on said first radial side of each filter and a perforated support wall on said second radial side of each filter, said at least one inlet opening being separated from another outlet opening which is axially aligned therewith, by said axially extending wall.

4,576,800

CATALYTIC CONVERTER FOR AN AUTOMOBILE

William B. Retallick, West Chester, Pa., assignor to Camet, Inc., Hiram, Ohio

Filed Sep. 13, 1984, Ser. No. 650,085
Int. Cl.[4] F01N 3/10
U.S. Cl. 422—180 10 Claims

1. A catalytic converter for an automobile comprising a single strip of metal folded back and forth upon itself, the strip having at least one slot along each line of folding, the slots being aligned with each other across adjacent layers of the strip, each folded slot defining a notch, the notches together defining at least one groove along the periphery of the folded strip, and at least one canister section, the canister section being shaped to coincide with the shape of the folded strip, the canister section having at least one ridge shaped to mate with the groove, the canister section being wrapped around the folded strip so as to maintain the strip in a fixed position.

4,576,801

PESTICIDAL SHEETS OR CONTAINERS

Lawrence J. Parry, Darwin, and Bruce J. Morrison, 8 Tasman Circuit, Wagaman, both of Australia, assignors to Bruce J. Morrison, Australia

PCT No. PCT/AU83/00188, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/02447, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 20, 1983, Ser. No. 629,475
Claims priority, application Australia, Dec. 20, 1982, PF7337; May 25, 1983, PF9526
Int. Cl.[4] B05D 5/00; C09D 5/14; A01N 25/34; A61F 13/00
U.S. Cl. 427—288 6 Claims

1. A method of manufacturing an item applicable to a surface or area to proof the item, surface or area against crawling insects, the method including the steps of:

(a) mixing a pesticide with a liquid carrier, said liquid carrier comprising a printer's ink or ink/solvent mixture and said pesticide comprising a wettable-powder or liquid pesticide soluble in a water-or alcohol-based printer's ink or the solvent;

(b) applying the pesticide/carrier solution to the surface or surfaces of said item by printing or silk-screening methods; and

(c) drying the solution to remove the liquid carrier and to leave the pesticide in or on the item to be contacted by the crawling insects.

4,576,802

METHOD OF DISSOLVING IMPURE URANIUM TETRAFLUORIDE

Antoine Floreancig, St Genis Laval, France, assignor to Uranium Pechiney Ugine Kuhlmann, Paris, France

Filed Aug. 3, 1983, Ser. No. 519,922
Int. Cl.[4] C01G 43/00
U.S. Cl. 423—20 12 Claims

1. In a method of dissolving impure uranium tetrafluoride in a hot state in a nitric acid solution to which an aluminum compound has been added to complex the fluoride ions, the improvement comprising dissolving the tetrafluoride in two stages, the first stage comprising the steps of introducing a quantity of nitric acid that is at most 0.9 times the quantity of nitric acid required to solubilize the uranium tetrafluoride, introducing a quantity of the aluminum compound that is at most 0.95 times the stoichiometric quantity corresponding to the formation of AlF_6^{3-}, and agitating the resultant suspension during the first stage for a period of at least 0.5 hour, and the second stage comprising the steps of introducing a quantity of nitric acid such that the total quantity of nitric acid added during both of said stages results in a free acidity at the end of the second stage of at least 0.5 mole of nitric acid per liter of solution, adding a quantity of aluminum compound such that the total quantity of aluminum compound added during both of said stages is at least equal to the stiochiometric quantity corresponding to the formation of AlF_6^{3-}, and agitating the suspension during the second stage.

4,576,803

METHOD OF PRODUCING CALCIUM SULFATE DIHYDRATE IN CONNECTION WITH THE DESULFURIZATION OF FLUE GASES

Karl-Rudolf Hegemann, Essen; Helmut Weissert, Bochum, and Jürgen Laimkühler, Essen, all of Fed. Rep. of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkuhlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,916
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245754
Int. Cl.[4] C01B 17/00
U.S. Cl. 423—242 3 Claims

1. A method of operating a scrubbing column for the scrubbing and desulfurizing of flue gas from a fossil-fired power plant, comprising the steps of:

(a) preparing a scrubbing liquid by introducing lime and water into the sump of a scrubbing column containing a suspension of calcium sulfate dihydrate in the scrubbing water;

(b) scrubbing and desulfurizing said flue gas by passing it through a portion of said column above said sump in counterflow to scrubbing liquid which collects in this sump while introducing oxygen into the liquid in the sump;

(c) continuously recirculating the scrubbing liquid from this sump to the scrubbing of flue gas above said sump;

(d) detecting the solids concentration of said suspension;

(e) commencing at intervals a withdrawal of said suspension from said sump upon the detection of a solids concentration of said suspension at a maximum value in the range of 40 to 130 g/l;

(f) terminating the withdrawal upon the the solids concentration in said suspension falling to a minimum value in said range;

(g) adding make-up water to the suspension of said sump; and

(h) processing the withdrawn suspension to recover calcium sulfate dihydrate therefrom.

4,576,804

STABILIZED SOLUTIONS OF HYDROXYLAMINE OR ITS SALTS

Otto-Alfred Grosskinsky; Elmar Frommer; Josef Ritz, all of Ludwigshafen; Erwin Thomas, Freinsheim, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,306
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343600
Int. Cl.[4] C01B 21/14
U.S. Cl. 423—265 6 Claims

1. A stabilized solution of hydroxylamine or its salts in water or an alcohol, which contains a hydroxyanthraquinone.

4,576,805

INCREASING LATTICE METAL CONTENT OF POROUS INORGANIC CRYSTALLINE COMPOSITIONS

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobile Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 412,362, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 333,369, Dec. 22, 1981, abandoned. This application May 10, 1983, Ser. No. 493,192

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.[4] C01B *33/20, 33/28, 35/10;* B01J *29/04*

U.S. Cl. 423—277 22 Claims

1. A method for increasing the total amount of lattice metal in the framework of a porous inorganic crystalline composition comprising 98 mole percent or more SiO_2 and 2 mole percent or less oxides of at least one initial lattice metal selected from those of Groups IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of the Elements and having an anhydrous anionic framework molar composition expressed by the formula

$$(1-x)SiO_2:(x)MO_{n/2}$$

wherein x is less than or equal to 0.02, M is said initial lattice metal and n is the valance of M, which comprises

contacting said crystalline composition at a temperature of from about 100° C. to about 850° C. with a volatile compound comprising at least one metal to be coordinated in the framework of said crystalline composition for a time sufficient to increase the total amount of lattice metal in the framework of said crystalline composition wherein said total amount is greater than the amount of said initial lattice metal prior to said contacting, said volatile compound comprising said metal having a radius ratio of less than about 0.6 and a size and shape which permits said volatile compound to enter the pores of said crystalline composition at the contacting temperature,

converting said volatile compound contacted inorganic crystalline composition to the hydrogen or hydronium form,

and recovering a porous inorganic crystalline-composition of enhanced cation exchange capacity.

4,576,806

REMOVAL OF SALT FROM POLYPHOSPHAZENE

Matthew K. Juneau, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 29, 1985, Ser. No. 718,004

Int. Cl.[4] C01B *25/10*

U.S. Cl. 423—300 28 Claims

1. A process for making a low-salt polyphosphazene said process comprising

(A) reacting a solution of a polyphosphonitrilic halide with a substituting agent selected from alkali metal alkoxides, alkali metal aryloxides or both alkali metal alkoxides and aryloxides to form a solution of alkoxy-substituted, aryloxy-substituted or both alkoxy and aryloxy-substituted polyphosphazene containing alkali metal halide contaminant,

(B) neutralizing residual alkali metal alkoxide and/or aryloxide,

(C) adding water and a lower water-soluble alcohol to the substituted polyphosphazene solution to dissolve said alkali metal halide,

(D) separating an aqueous phase containing said alkali metal halide and a non-aqueous organic phase containing said low-salt polyphosphazene, and

(E) recovering said low-salt polyphosphazene from said organic phase.

4,576,807

PRODUCTION OF ZEOLITE Y

Cecil P. Loechelt, II, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 6, 1984, Ser. No. 638,246

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—329 10 Claims

1. A method of producing crystalline synthetic faujasite, comprising the steps of separately preparing a sodium silicate solution and a sodium aluminate solution, providing an activated sodium silicate system by mixing said sodium silicate solution at ambient temperature with finely ground dry seed synthetic faujasite of the zeolite Y type product desired in an amount of about four percent of the final product and then cooking at about 100° C. for about four hours or more, cooling the activated sodium silicate system to about ambient temperature, mixing the sodium aluminate solution with the activated sodium silicate system at ambient temperature to provide a reaction mixture having a molar ratio of $(5.0–8.5)Na_2O.Al_2O_3.(15.0–25.0)SiO_2.(100–180)H_2O$, heating the reaction mixture to about 100° C. for about twelve hours or more with agitation until the desired crystalline synthetic faujasite is formed, and recovering said faujasite.

4,576,808

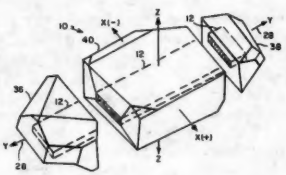
QUARTZ GROWTH ON X-SEEDS

Alton F. Armington, Lexington, and John J. Larkin, Methuen, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,130

Int. Cl.[4] C30B *29/18*

U.S. Cl. 423—335 2 Claims



1. A method for producing a substantially dislocation-free crystal seed material for use in the growing synthetic quartz, single crystal boules which comprises the steps of:

(A) providing a synthetic quartz, single crystal boule with its length directed along a crystallographic Y-axis orientation, its width directed along a crystallographic Y-axis orientation, its thickness directed along a crystallographic Z-axis orientation and wherein said Z-axis defines a Z region of crystal growth and said X-axis defines an X-minus and an X-plus region of crystal growth;

(B) slicing and removing the X-plus region of growth from said crystal boule;

(C) slicing a plurality of seed crystals from said X-plus region of growth such that each of said seed crystals displays a substantially rectangular prism configureation having (1) two oppositely disposed and parallel Z face surfaces running perpendicular to the Z axis orientation and along the longitudinal direction of the rectangular prism, (2) a first edge surface running perpendicular to the X-plus axis orientation and along the longitudinal thickness of the rectangular prism, (3) a second edge surface oppositely disposed and parallel to said first edge surface running perpendicular to the X-minus axis orientation, and (4) third and fourth oppositely disposed and parallel edge surfaces defining the longitudinal dimension of said rectangular prism and running in a direction perpendicular to said crystallographic Y-axis orientation.

4,576,809

PREPARATION OF ALKALI OR ALKALINE EARTH METAL COBALTTETRACARBONYLATES AND CATALYSTS OF CARBONYLATION REACTIONS THEREWITH

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Filed Nov. 7, 1983, Ser. No. 549,553

Claims priority, application France, Nov. 5, 1982, 82 18729; Sep. 13, 1983, 83 14732

Int. Cl.[4] C10G *1/04;* B01J *21/18, 27/20;* C07C *51/10*

U.S. Cl. 423—418 13 Claims

1. A process for the preparation of an alkali or alkaline earth metal cobalttetracarbonylate, comprising reacting a cobalt (II) compound with carbon monoxide in the presence of (i) an inorganic base which comprises an alkali or alkaline earth metal hydroxide or an alkali or alkaline earth metal bicarbonate and (ii) at least one sulfur compound comprising a sulfide, a polysulfide, a thiosulfate, a dithionate, a polythionate, or a mercaptan, and in a reaction medium consisting essentially of an alcohol, an ether, a mixture of water and an alcohol or a mixture of water and an ether.

10. The process as defined by claim 1, wherein the amount of sulfur compound, expressed in mole per gram-atom of cobalt, ranges from 0.01 to 1 mole.

12. The process as defined by claim 10, wherein the reaction temperature ranges from 10° to 150° C.

4,576,810

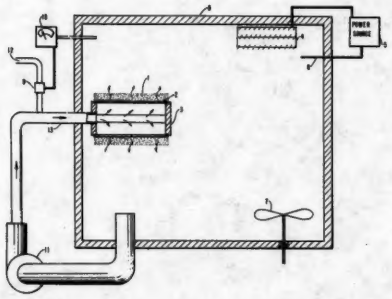
CARBON FIBER PRODUCTION

Hugh E. Redick, Simpsonville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 5, 1983, Ser. No. 520,526

Int. Cl.[4] D01F *9/12*

U.S. Cl. 423—447.1 12 Claims



1. A pitch fiber package suitable for direct oxiadation with a gaseous mixture containing oxygen and an inert gas which comprises an open ended, porous, non-expanding or collapsible spool with a densely packed mass of as-spun pitch carbon fibers wound thereon so as to leave open areas between fiber bundles.

4,576,811

PROCESS FOR ADJUSTING THE FIBER STRUCTURE OF MESOPHASE PITCH FIBERS

Dennis M. Riggs, and Hugh E. Redick, both of Simpsonville, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

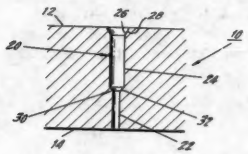
Continuation of Ser. No. 548,300, Nov. 3, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,521

Int. Cl.[4] D01D *5/00*

U.S. Cl. 423—447.2 4 Claims

1. A process for producing carbon fiber from a mesophase pitch feed material which comprises passing said pitch feed material into a spinnerette body having an entrance side for the pitch feed material and having an exit side for the carbon fiber;

the spinnerette body having a spinnerette channel passing through it from the entrance side to the exit side; the channel comprising a capillary bore leading from within the body and opening out of the exit side thereof and having a capillary length to diameter ratio of from about 2:1 to 8:1; a larger diameter bore leading from the entrance side of the body toward the capillary bore and wherein the ratio of the diameter of the larger diameter bore to the



diameter of the capillary bore is in the range between approximately 2:1 to 15:1; and

a capillary bore entrance leading from the larger diameter bore into the capillary bore; the entrance being defined by a wall which narrows from the larger diameter bore to the capillary bore; the entrance wall having an entrance angle of from 120 to 170 degrees, which is measured diametrically across the entrance wall in a plane including a diameter of the entrance wall and the apex thereof, which is flat enough for giving the carbon fiber formed through the channel a greater proportion of tangential crossection of fibers.

4,576,812

CHLORINATION OF COPPER, LEAD, ZINC, IRON, SILVER AND GOLD

Hardwin E. A. von Hahn, 8464 Adera St., Vancouver, British Columbia, Canada (V6P 5E7)

Filed Jun. 12, 1984, Ser. No. 619,874

Claims priority, application Canada, Jun. 17, 1983, 430668

Int. Cl.[4] C01G *21/16, 9/04, 3/04, 5/00*

U.S. Cl. 423—491 8 Claims

1. A process for making the choloride of a metal selected from the group consisting of copper, iron, lead, zinc, silver and gold from the sulfide of the selected metal in the absence of air which comprises:

(a) forming an intimate mixture of a solid finely divided sulfide of the selected metal with a solid chlorine source selected from the group consisting of ferric chloride, cupric chloride and mixture thereof in any proportions;

(b) heating said mixture to a temperature, below the melting points of said sulfide and said chlorine source, at which a rapid reaction takes place converting said metal sulfide to a metal chloride and elemental sulfur in the state of a solid aggregate mixture;

(c) recovering said metal chloride from said solid aggregate mixture.

4,576,813

HEAT RECOVERY FROM CONCENTRATED SULFURIC ACID

Donald R. McAlister, Ballwin, Mo., and Steven A. Ziebold, Waterloo, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 5, 1983, Ser. No. 510,527

Int. Cl.[4] C01B *17/98, 17/74, 17/48;* C22C *38/40*

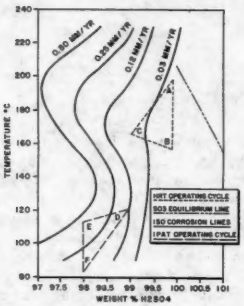
U.S. Cl. 423—522 49 Claims

1. In a process for the manufacture of sulfuric acid comprising the catalytic oxidation of sulfur dioxide to sulfur trioxide,

absorption of the sulfur trioxide in sulfuric acid, and cooling the sulfuric acid in a heat exchanger by transfer of heat to another fluid, the improvement which comprises:

contacting a gas comprising sulfur trioxide with sulfuric acid having a concentration of between 98% and 101%, thereby absorbing sulfur trixoide in the sulfuric acid and generating the heat of absorption, the absorption being carried out in a heat recovery tower to which said sulfuric acid is delivered at a concentration of at least 98% and a temperature of at least 120° C., and from which said sulfuric acid is discharged at a concentration of at least 99% and a temperature greater than 120° C.; and

removing the heat of absorption from said sulfuric acid in useful form through transfer of heat to another fluid in said heat exchanger and thereby heating said another fluid to a temperature greater than 120° C., said heat exchanger



comprising means for transfer of heat from said sulfuric acid to another fluid, said means comprising an alloy selected from the group consisting of ferrous alloys containing chromium, iron-nickel alloys containing chromium and nickel base alloys containing chromium, said alloy having a ferritic, austenitic or austenitic-ferritic duplex structure, the composition of the said alloy further satisfying the following relationship:

$$0.35(Fe+Mn)+0.70(Cr)+0.30(Ni)-0.12(Mo)>39$$

where:

Fe=the weight percent of iron in the alloy,
Mn=the weight percent of manganese in the alloy,
Cr=the weight percent of chromium in the alloy,
Ni=the weight percent of nickel in the alloy, and
Mo=the weight percent of molybdenum in the alloy.

4,576,814

CATALYST AND PROCESS FOR OXIDIZING HYDROGEN SULFIDE

Robert H. Hass, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 364,416, Apr. 1, 1982, Pat. No. 4,444,742, which is a continuation-in-part of Ser. No. 191,864, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,033, Apr. 4, 1979, Pat. No. 4,314,983. This application Dec. 28, 1983, Ser. No. 566,296

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.[4] C01B *17/02, 17/16, 17/48*

U.S. Cl. 423—573 G **49 Claims**

1. A process for oxidizing hydrogen sulfide comprising contacting hydrogen sulfide and an oxidant gas comprising a component selected from the group consisting of sulfur dioxide and oxygen with a catalyst comprising a vanadium component in combination with a component of bismuth, tin, or antimony on a support containing a crystalline material selected from the group consisting of a crystalline silica molecular sieve or a crystalline zeolite, said silica or zeolite having a water sorption capacity of no more than 0.05 gram of water per anhydrous gram of crystalline material when the ratio of the water vapor partial pressure at 25° C. to the water saturation pressure at 25° C. is 0.8, under conditions causing said hydrogen sulfide to react with said component to produce elemental sulfur.

4,576,815

PROCESS FOR THE EXTRACTION OF METAL VALUES AND NOVEL METAL EXTRACTANTS

Frank Robinson, Gt. Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

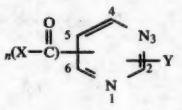
Filed Oct. 12, 1983, Ser. No. 541,120

Claims priority, application United Kingdom, Jul. 7, 1983, 8318412

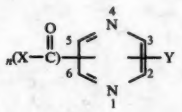
Int. Cl.[4] B01D *11/00*

U.S. Cl. 423—658.5 **8 Claims**

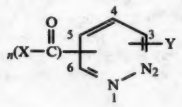
1. A process for extracting metal values from aqueous solutions of metal salts containing halides or pseudo halide anions which comprises contacting the aqueous solution with a solution in a water-immiscible organic solvent of a substituted pyrimidine, pyrazine or pyridazine of formula:



or



or



wherein

X is the group —OR_1 or —NR_2R_3, R_1 being a hydrocarbyl group containing from 1 to 36 carbon atoms and R_2 and R_3 separately being hydrogen or a hydrocarbyl group, and R_2 and R_3 together containing from 1 to 36 carbon atoms;

n is 1, 2 or 3; and

Y represents one or more optionally substituted phenyl groups,

provided that there is present in the molecule a total number of from 5 to 36 alkyl carbon atoms.

4,576,816

DENTIFRICE COMPOSITION

Nobuo Suganuma, Funabashi; Masafumi Anzai, Kawasaki; Nobuyuki Takada, Chigasaki, and Hiromichi Ichikawa, Mitaka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 190,175, Sep. 23, 1980. This application Aug. 13, 1982, Ser. No. 407,901

Claims priority, application Japan, Oct. 27, 1979, 54-139057

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] A61K *7/18, 7/20*

U.S. Cl. 424—50 15 Claims

1. A dentifrice composition, consisting essentially of: 100–100,000 units of dextranase per gram of the composition; and an aluminum oxide compound having the formula:

$$Al_2O_3.nH_2O$$

wherein $n \geqq 0$, with an average particle size of 1 to 50 microns incorporated as a main abrasive in an amount of 20 to 90% by weight of the composition wherein the activity of the dextranase is stable upon storage.

4,576,817

ENZYMATIC BANDAGES AND PADS

Robert E. Montgomery, Pacific Palisades, and Michael A. Pellico, Los Angeles, both of Calif., assignors to Laclede Professional Products, Inc., Gardena, Calif.

Filed Jun. 7, 1984, Ser. No. 618,071

Int. Cl.[4] A61K *37/48*

U.S. Cl. 424—94 20 Claims

1. An enzymatic substantially organic absorbent material for body contact application containing, per gram of material, from about 1.0 to about 1,000 International Units of serum-activated oxidoreductase enzyme for producing hydrogen peroxide upon contact of said material with serum.

4,576,818

IODOPHOR COMPOSITION

Bola V. Shetty, Stamford, Conn., assignor to Euroceltique, S.A., Luxembourg

Filed Aug. 7, 1984, Ser. No. 638,558

Int. Cl.[4] A01N *59/12;* A61K *33/18*

U.S. Cl. 424—150 6 Claims

1. A germicidal complex of iodine with polydextrose wherein the amount of iodine is up to 20%.

4,576,819

ALUMINUM HYDROXIDE GEL, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF

Shigeo Miyata, and Tsutomu Nosu, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 249,454, Mar. 31, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,164

Int. Cl.[4] A61K *33/10*

U.S. Cl. 424—156 2 Claims

1. An amorphous aluminum hydroxide gel of formula (I) in which Ca and/or Mg are bonded to the compound of formula (I) by ion-exchange with an alkali metal,

$$(CaO, MgO, M_2O)_x.Al_2O_3.(CO_2)_y.mH_2O \quad (I)$$

wherein M represents an alkali metal, M_2O may be zero, CaO and MgO are not zero at the same time and x, y and m are positive numbers represented by the following expressions

$$0.1 \leqq x < 0.8,$$

$$0.4 \leqq y \leqq 0.8,$$

$$2 \leqq m < 10$$

said amorphous aluminum hydroxide gel being produced by the process which comprises reacting an aluminum compound soluble in water and/or lower alcohols selected from the group consisting of aluminum chloride, aluminum nitrate, aluminum sulfate, aluminum metal, aluminum ammonium sulfate, aluminum bromide, aluminum fluoride, aluminum potassium sulfate, aluminum isopropoxide, sodium aluminate, potassium aluminate, and aluminum sodium sulfate, with a carbonate ion yielding compound soluble in water and/or lower alcohols selected from the group consisting of sodium carbonate, potassium carbonate, sodium hydrogen carbonate and potassium hydrogen carbonate, at a pH of about 6 to about 9.5 under such conditions that the CO_2/Al mole ratio of the resulting aluminum hydroxide gel is about 0.1–about 8, and ion exchanging the alkali metals of the resulting compound with magnesium and/or calcium.

4,576,820

PROCESS AND APPARATUS FOR FREEING BITTER LUPIN SEED OF BITTER SUBSTANCES THEREIN

Peter Hussmann, Florence, Italy, assignor to Mittex Aktiengesellschaft, Vaduz, Liechtenstein

PCT No. PCT/EP82/00164, § 371 Date Apr. 4, 1983, § 102(e) Date Apr. 4, 1983, PCT Pub. No. WO83/00419, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 6, 1982, Ser. No. 482,335

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131207; Jan. 19, 1982, 3201378; May 21, 1982, 3219245

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 8 Claims

1. A process for debittering particulate starting material comprised of bitter lupin seed, said material containing extractable bitter substances, comprising the steps of:

(a) providing a series of separate extract solutions, each solution of said series having a differing concentration of said bitter substances, said series having at least a highest-, a second highest-, and a lowest-concentration extract solution;

(b) providing a filter medium comprised of a layer of said particulate starting material, which filter medium is contacted by said highest-concentration extract solution in said series;

(c) sequentially contacting said layer with each extract solution of the remaining extract solutions in said series, respectively, in a predetermined order of decreasing concentration of said bitter substances;

(d) after step (c), contacting said layer with pure water;

(e) removing said highest-concentration extract solution from said series, so that said second highest-concentration extract becomes the highest-concentration extract solution in said series; and

(f) repeating steps (b) through (e) at least once,

wherein (i) said starting material is comprised of bitter lupin seed which was milled beforehand to a particle size in the range of about 1 to about 50 microns, (ii) said layer of said particulate starting material is between about 5 and about 50 mm in thickness, (iii) said highest-concentration extract solution contains a percentage of dry mass between about 10 and 30%, and (iv) said steps (b), (c) and (d) are carried out at a temperature of about 30° C. or less.

4,576,821

LONG LIFE SEMI-ARTIFICIAL BAIT

Malcolm S. Smith, Beaumont, and Colastie J. Daigle, Orange, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1985, Ser. No. 754,156

Int. Cl.[4] A23L *1/325;* A01K *85/00*

U.S. Cl. 426—1 18 Claims

1. Fish and crustacean bait consisting essentially of

(a) from about 5 to about 50 wt. % of a water insoluble

polymer having a melting point below about 110° C. selected from the group consisting of polyamides and copolymers of ethylene with from about 15 to about 45 wt. % of at least one ethylenically unsaturated comonomer;

(b) from about 45 to about 95 wt. % of attractant selected from the group consisting of fish meal, and powdered fish; and

(c) from 0 to about 20 wt. % of fish oil.

4,576,822

PROCESS FOR THE PRODUCTION OF FERMENTED MILK PRODUCTS

Viljo T. J. Nordlund, Helsinki, Finland, assignor to Valio Meijerien Keskusosuusliiki, Helsinki, Finland

Continuation of Ser. No. 459,033, Jan. 18, 1983, abandoned. This application Sep. 6, 1984, Ser. No. 648,344

Claims priority, application Finland, Jan. 22, 1982, 820206

Int. Cl.⁴ A23C *9/12, 17/02*

U.S. Cl. 426—43 **13 Claims**

1. A process for producing a liquid fermented milk product, comprising the successive steps of:

(1) treating milk at a temperature of 0°–5° C. for a sufficient period of time with a solution of an enzyme selected from a rennet enzyme used for cheesemaking or proteolytic enzyme having a rennet-type action, to form a liquid, cold-coagulated milk, wherein the concentration of the enzyme solution is such that upon addition of 0.25 to 0.5% by weight of the solution, the milk contains 1/5–1/15 million rennet activity units,

(2) subjecting the milk treated with the rennet enzyme to a heat treatment for a sufficient period of time in order to convert the paracasein of the milk to a calcium paracaseinate and to inactivate the rennet enzyme, and thereafter

(3) innoculating the treated milk of step (2) with a sufficient amount of a starter culture of the liquid fermented milk product and subjecting the thus innoculated milk to fermentation and ripening to form the fermented milk product.

4,576,823

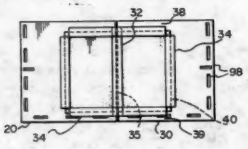
VACUUM SHEET

William A. Davies, P.O. Box 468, Richmond, Ontario, Canada K0A 2Z0

Filed Oct. 31, 1984, Ser. No. 666,939

Int. Cl.⁴ B32B *3/14;* G03B *27/60*

U.S. Cl. 428—61 **17 Claims**



1. A vacuum sheet for use in a contact vacuum frame to improve vacuum times, comprising:

at least two substantially planar sheets of material jointed together to form at least a partially open seam therebetween, said seam facilitating the evacuation of air from the vicinity of the vacuum sheet; and

a third planar sheet of material applied to one side of said at least two sheets to reinforce the same and to cover at least a portion of said seam formed therebetween.

4,576,824

PROCESS FOR MATURING STRONG BEVERAGES

Jury K. Gubiev, ulitsa Parshina, 25, korpus 1, kv. 178; Valery V. Krasnikov, ulitsa Festevalnaya, 9, kv. 96; Valentin P. Bakulin, 3 Likha-chevsky pereulik, 7, korpus 1, kv. 19; Mikhail A. Gagarin, ulitsa Profsojuznaya, 35/11, kv. 167; Vladimir V. Ivanov, ulitsa Sivashskaya, 4, korpus 3, kv. 64, and Zbignev N. Kishkovsky, ulitsa Begovava, 22, korpus 3, kv. 207, all of Moscow, U.S.S.R.

Filed Aug. 31, 1984, Ser. No. 646,625

Int. Cl.⁴ C12H *1/22*

U.S. Cl. 426—241 **6 Claims**

4. A process for maturing strong spirits which comprises:

activating an oak stave which has been used in maturing strong spirits by separating the stave from contact with the strong spirits and alternately heating the stave to a temperature of 35° to 55° C. in a multimode electromagnetic field of standing waves, having a frequency range of 2,000 to 4,500 MHz, in the presence of an oxygen containing gaseous medium and cooling the heated to a temperature in the range of 15° to 25° C. in the presence of an oxygen containing gaseous medium to provide an activated stave having a residual spirit content of from 5 to 10% and maturing the strong spirits in contact with the activated stave.

4,576,825

METHOD AND COMPOSITION FOR CURING MEAT

Catherine O. Tracy, Scottsdale; Evan F. Binkerd, Phoenix; Robert B. Rendek, and Raymond J. Wrobel, both of Scottsdale, all of Ariz., assignors to Conagra, Inc., Omaha, Nebr.

Filed Apr. 23, 1979, Ser. No. 32,191

Int. Cl.⁴ A23B *4/12;* A23L *3/34*

U.S. Cl. 426—266 **21 Claims**

1. A process for preparing cured ham or bacon so as to reduce the quantity of nitrosamines formed when the cured meat is subjected to frying temperatures, comprising the steps of

injecting ham or bacon belly meat with a curing solution containing alkali metal nitrite and a sufficient amount of food grade acid encapsulated with a non-toxic coating material which melts at a temperature above 115° F., said acid being in an amount sufficient to provide a desired concentration in the meat to react with and substantially reduce or deplete the nitrite and being capable, in its encapsulated form, of causing reduction of nitrite concentration in said solution,

holding the meat at a temperature below the melting point of said coating material for a period of time to permit the nitrite to exert its color-developing and anti-botulism effect on the meat, and

thereafter processing the meat at a temperature sufficient to melt said coating material and thus release the acid into said meat in order for it to react with said injected nitrite, thereby reducing the amount of nitrite available for reaction with amines contained in the meat whereby the nitrosamine formation is reduced upon frying.

13. A meat curing composition for reducing the quantity of nitrosamines formed in ham or bacon, comprising an injectible meat curing solution containing nitrite and a food grade acid encapsulated with a non-toxic coating material which melts above 115° F., said acid being present in said solution in an amount sufficient to provide a concentration of at least 300 ppm in the meat, and said acid being further characterized as being capable, in its unencapsulated form, of causing reduction of nitrite concentration in said solution.

4,576,826
PROCESS FOR THE PREPARATION OF FLAVORANT CAPSULES

Richard T. Liu, Worthington; Winston R. Nickerson, and Charles H. Anderson, both of Marysville, all of Ohio, assignors to Nestec S. A., Vevey, Switzerland

Continuation-in-part of Ser. No. 203,389, Nov. 3, 1980, abandoned, which is a continuation of Ser. No. 931,503, Aug. 7, 1978, abandoned. This application Dec. 21, 1981, Ser. No. 333,172

Int. Cl.[4] A23L *1/221*

U.S. Cl. 426—289 **6 Claims**

1. A process for producing flavorant capsules having a long-shelf life comprising:

(a) adding particulated frozen aqueous essence to a wall material having a particle size of from 60 μm to 150 μm of powdered edible protein material, carbohydrate material, or a powdered edible material comprised of a combination of proteins and carbohydrates in a ratio of from 1:4 to 1:50 by weight of particulated frozen aqueous essence to powdered wall material while the wall material is being agitated at ambient temperature so as to (i) form coated particles, each such coated particle having a continuous layer of said wall material surrounding a frozen aqueous essence particle and to (ii) cause a water flux from the frozen aqueous essence particle to the surrounding wall material;

(b) curing the coating particles by continuing agitation of the wall material until the water flux ceases so as to form a continuous hardened, impervious shell of the said wall material having impregnated therein the flavor and/or aroma principles and having a wall thickness of from about 20 μm to 400 μm surrounding a hollow core; and then

(c) collecting the capsules having a particle size in the range of from 250 μm to 3.5 mm.

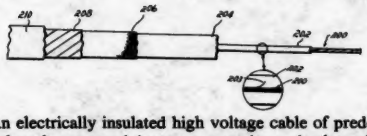
4,576,827
ELECTROSTATIC SPRAY COATING SYSTEM

Donald R. Hastings, Elyria, and John Sharpless, Oberlin, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 23, 1984, Ser. No. 602,974

Int. Cl.[4] B05D *4/04;* **H01C** *13/00*

U.S. Cl. 427—27 **57 Claims**



1. An electrically insulated high voltage cable of predetermined length measured between opposite ends thereof for conducting electrostatic voltages in excess of approximately 50 KV to a coating-charging electrode in an electrostatic spray coating system, comprising:

a plurality of substantially equal length continuous silicon carbide fibers electrically connected primarily in parallel, said fibers each having a length in the approximate range of 1 m–50 m and extending between opposite ends of the cable to provide electrical current flow paths primarily substantially longitudinally along the length of said cable, said plurality of parallel-connected fibers collectively having a diameter measured generally transversely to the length of the cable in the approximate range of 10^{-2} cm.–1 cm. and a specific resistivity selected to provide a total resistance measured between the opposite ends of the cable in the approximate range of 1M–1000M ohms, and

an insulative sheath surrounding said parallel-connected fibers having a wall thickness and dielectric strength to avoid dialectric breakdown when said cable is connected to an electrostatic voltage supply in excess of approximately 50 KV.

30. A method of conducting high electrostatic voltages in excess of approximately 50 KV from a high voltage electrostatic supply to a coating-charging electrode in an electrostatic spray coating system comprising:

interconnecting between the electrode and the high voltage supply a cable having opposite ends and composed of substantially equal length continuous silicon carbide fibers electrically connected primarily in parallel and disposed along said cable to provide electrical current flow paths primarily substantiallly longitudinally along the length of said cable, said fibers each having a length measured along the length of said cable in the approximate range of 1 m–50 m, said plurality of parallel-connected fibers collectively having a diameter mesured generally transversely to the length of said cable in the approximate range of 10^{-2} cm.–1 cm. and a specific resistivity selected to provide a total resistance between said opposite ends of the cable in the approximate range of 1M–1000M ohms, and

energizing the fibers with an electrostatic voltage in excess of 50 KV while insulated to avoid dielectric breakdown to cause electrical current to flow along the length of said cable between said electrode and high voltage supply.

31. A method of electrostatic spray coating an article comprising the steps of:

interconnecting between an electrode and a high voltage supply a cable having opposite ends and composed of substantially equal length continuous silicon carbide fibers electrically connected primarily in parallel and disposed along said cable to provide electrical current flow paths primarily substantially longitudinally along the length of said cable, said fibers each having a length measured along the length of said cable in the approximate range of 1 m–50 m, said plurality of parallel-connected fibers collectively having a diameter measured generally transversely to the length of said cable in the approximte range of 10^{-2} cm.–1 cm. and a specific resistivity selected fo provide a total resistance between said opposite ends of said cable in the approximate range of 1M–1000M ohms, and

energizing the fibers with an electrostatic voltage in excess of 50 KV while insulated to avoid dielectric breakdown to cause electrical current to flow along the length of the cable between the electrode and the high voltage supply,

transporting coating material in electrostatic charge transfer relationship to the energized electrode to electrostatically charge the coating material, and

directing charged particles of coating material toward an article to the coated while maintaining the article at an electrostatic potential different from that of the electrode.

4,576,828
METHOD AND APPARATUS FOR PLASMA SPRAY COATING

Frank A. Walker, Jr., Huntington Beach, Calif., assignor to Geotel, Inc., Amityville, N.Y.

Filed May 17, 1984, Ser. No. 611,474

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—34 **18 Claims**

1. A vacuum chamber plasma spraying system for continuous plasma spray coating of parts, said system comprising

a vacuum chamber for receiving parts to be sprayed,

means for decreasing pressure in said chamber,

a plasma spray gun mounted in the chamber,

input and output air locks,

means for decreasing pressure in said air locks,

entrance and exit ports connecting the chamber in sealed relation to respective air locks,

entrance and exit closure members slidably mounted to alternatively open or close said ports,

a track extending from said input air lock through the chamber and into said output air lock, said track having gaps at said ports for receiving said closure members,

a plurality of carriers movably supported on the track, and

a plurality of linear induction motors having mutually spaced stators mounted to and along the track, said gaps being positioned at spaces between said stators, whereby said closure members may also be received in the spaces between the stators, said motors including a plurality of armatures respectively fixed to individual carriers, whereby said carriers may be driven along the track and through said ports when said closure members are open.

17. The method of plasma coating a part in a flow-through series of process steps comprising

providing a controlled environment chamber with input and output air locks,

plasma spray coating a part at a spraying station within said chamber,

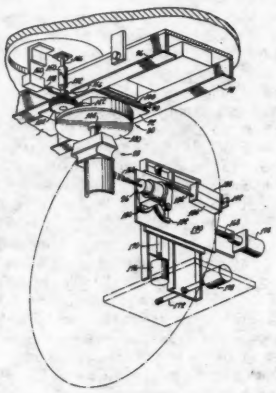
unloading a part from said output air lock while a part is at said spraying station,

loading a part into said input air lock while a part is at said spraying station,

providing said controlled environment to said air locks,

shifting a part from said input air lock to said chamber and shifting a part from said chamber to said output air lock,

sealing said chamber from said air locks,



repeating said steps of loading and unloading said air locks, shifting parts to and from said chamber, providing the controlled environment to said air locks, and spraying a part in said chamber,

said method further including preheating a part at a preheating station in said chamber while a part is being sprayed at said spraying station,

shifting a part from said preheating station to said spraying station,

shifting a part from said load lock into said chamber, said step of

shifting a part from said load lock into said chamber including shifting a part to said preheat station, said air locks being provided with ports for selectively sealing the locks from the chamber and from ambient atmosphere, said shifting comprising mounting a track to extend through said air locks and through said chamber with gaps in the track at said ports,

positioning linear motor stators along said track at opposite sides of the gaps,

connecting motor armatures to said parts, selectively energizing individual ones of said stators, and

sliding sealing gates into said track gaps to seal said chamber.

4,576,829

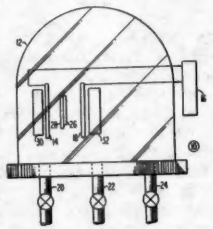
LOW TEMPERATURE GROWTH OF SILICON DIOXIDE ON SILICON

Grzegorz Kaganowicz, Belle Mead, N.J.; John W. Robinson, Levittown, and John H. Thomas, III, Holland, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 28, 1984, Ser. No. 687,366

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—39 **3 Claims**



1. A method of growing an oxide film on a silicon substrate by plasma oxidation in a magnetically enhanced glow discharge system which method comprises the steps of;

placing the substrate in the deposition chamber of said system;

evacuating the chamber;

introducing a gaseous oxygen-containing precursor into the chamber;

initiating an oxygen plasma in the chamber by applying sufficient power from a power source through a magnetron electrode to provide an effective power density of between about 1 and 15 Watts per square centimeter of electrode; and

maintaining the temperature of the silicon substrate below about 130° C. during oxidation.

4,576,830

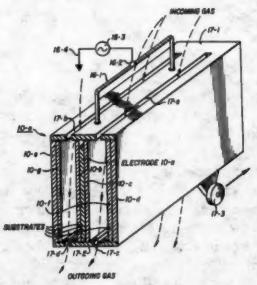
DEPOSITION OF MATERIALS

Zoltan Kiss, Belle Mead, N.J., assignor to Chronar Corp., Princeton, N.J.

Filed Nov. 5, 1984, Ser. No. 668,132

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—39 **20 Claims**



1. A box carrier for the deposit of materials, comprising

a plurality of side walls which have a region of separation,

a plurality of end walls joining said side walls,

a substrate positioned in said carrier against one of said side walls,

means for introducing a gaseous mixture into said region to permit a deposit therefrom on said substrate, and

means for exhausting said gaseous mixture from said region.

10. The method of depositing material on substrates which comprises the steps of

(a) providing a box carrier which contains at least one of said substrates; and

(b) moving said carrier to a plurality of successive positions where a prescribed gas mixture is introduced into said chamber.

4,576,831

PROCESS FOR PRODUCING HEAT-SENSITIVE RECORDING PAPER

Noriyuki Hosoi; Kensuke Ikeda, and Hiroharu Matsukawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 23, 1983, Ser. No. 525,773

Claims priority, application Japan, Aug. 23, 1982, 57-145872

Int. Cl.[4] B41M *5/18*

U.S. Cl. 427—40 3 Claims

1. A process for producing a heat-sensitive recording paper which comprises pretreating a base paper by a high-frequency corona discharge and then applying an aqueous-type coating solution for forming a heat-sensitive recording layer to the base paper, wherein the high-frequency corona discharge treatment is carried out utilizing a discharge frequency in the range of 5 to 200 KHz and is carried out such that the product of the discharge electric current and the discharge voltage applied to a unit width is in the range of 0.5 KVA/m^2 to 50 KVA/m^2.

4,576,832

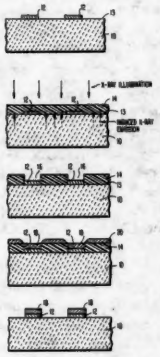
SELF-ALIGNING MASK

George A. Walker, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 454,899, Dec. 30, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,223

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—43.1 13 Claims



1. A method of forming a resist mask over a surface of a dielectric substrate having a metallurgy pattern on said surface comprising the steps of:

blanket coating said surface with said resist;

exposing said surface to resist insensitive X-rays that induce resist sensitive X-ray radiation from portions of said dielectric substrate not masked by said metallurgical pattern; and

developing said exposed resist for removal thereof of portions only over said metallurgical pattern to produce a self-aligned resist mask.

4,576,833

METHOD OF FORMING A LUMINESCENT LAYER ON A CARRIER AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP HAVING A LAYER APPLIED TO A CARRIER BY MEANS OF SUCH A METHOD

Pieter C. Scholten, and Ronald K. Eijnthoven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,605

Claims priority, application Netherlands, Oct. 26, 1983, 8303685

Int. Cl.[4] H01J *61/35, 61/46*

U.S. Cl. 427—67 3 Claims

1. A method of forming a layer of luminescent material on a glass carrier from a suspension of grains of luminescent material in a colloidal solution of a binder in a suspension medium, which suspension is contacted with the carrier in such a manner that a layer of suspension adheres thereto, the non-adherent residue of suspension is removed and the layer adhered to the carrier is dried, characterized in that the binder mainly comprises fibrous boehmite crystals up to at most 7% by weight measured with respect to the quantity of luminescent material present in the suspension.

4,576,834

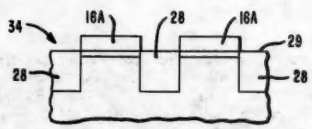
METHOD FOR FORMING TRENCH ISOLATION STRUCTURES

Zbigniew P. Sobczak, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed May 20, 1985, Ser. No. 735,515

Int. Cl.[4] H01L *21/316*

U.S. Cl. 427—93 7 Claims



1. A process for fabricating a planarized recessed silicon oxide structure in a silicon substrate trench from converted organosilicon material, comprising selectively depositing a layer of organosilicon material in a substrate trench to a height selected to provide a planar silicon oxide-substrate topography upon conversion of said material, the trench being bounded by a silicon substrate surface having thereon a coating of polymer material which is non-wetting to the layer of organosilicon material; and, heating the organosilicon material to convert said material to silicon oxide.

4,576,835

AQUEOUS RELEASE AGENTS

Karl-Josef Gardenier, and Wolfgang Heimbuerger, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,528

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410957

Int. Cl.[4] B05D *5/08, 7/02;* C09J *3/14;* C09K *3/00*

U.S. Cl. 427—222 5 Claims

1. A method for the temporary antiadhesive surface finishing of tacky pellets, granulates, cubes or flakes of hotmelt adhesives, comprising applying thereto an aqueous release agent consisting essentially of an about 0.5 to about 25% by weight solution of (a) at least one of an at least dihydric aliphatic alcohol containing from 3 to 7 carbon atoms, or (b) at least one aliphatic dicarbxylic or tricarboxylic acid or water-soluble salt thereof, or (c) a mixture of (a) and (b), wherein said aqueous release agent is applied in an amount of about 0.5 to about 10% based on the adhesive.

4. A method in accordance with claim 1 wherein from about 0.2 to about 15% by weight, based on the weight of the aqueous agent, of a water-insoluble salt of a C_{12}–C_{36} saturated aliphatic or alicyclic mono- or dicarboxylic acid is also present in the aqueous release agent.

4,576,836

METHOD FOR PRODUCING A REFRACTORY COMPOSITE STRUCTURE

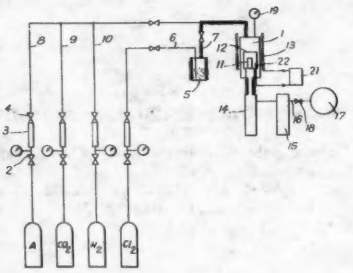
Robert Colmet, 129 avenue de Saint Médard, Eysines, France 33320; Roger Naslain, Résidence du Pontet "Les Jones", avenue du Pontet, Pessac, France 33600; Paul Hagenmuller, 351, avenue de la Libération, Talence, France 33405, and Pierre Lamico, 37, rue Louis Pasteur, Bruges, France 33520

Filed Jan. 19, 1983, Ser. No. 459,332

Claims priority, application France, Jan. 22, 1982, 82 01025

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—255 11 Claims



1. Method for producing a refractory composite structure, comprising the densification of a refractory fibrous preform in ceramic material by a matrix at least partly constituted by an oxide having a melting point higher than 1750° C. wherein the fibrous preform is placed inside an infiltration chamber where it is heated within a reacting gaseous mixture introduced into the chamber and containing at least one gaseous hydrolyzing or oxiding agent and a volatile hydrolizable or oxidizable compound of the one element or of each element of which the oxide is a constituent of the matrix of the structure to be produced, in order to obtain by chemical reaction an adhesive deposit of said oxide or oxides constituting said matrix, the values of the overall pressure, of the temperature and of the gas flow rates inside the infiltration chamber being selected to be at a level slightly higher than the minimum values necessary for producing the said chemical reaction, so as to enable the constituents of the gaseous reaction mixture to penetrate to the bottom of the pores in the fibrous preform before having reacted completely such that the pores are densified throughout their length with the adhesive deposit.

4,576,837

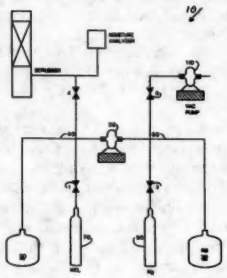
METHOD OF TREATING SURFACES

Gregorio Tarancon, Woodbridge, N.J.; Efrain Acevedo, Yonkers, N.Y., and Abel Saud, Jersey City, N.J., assignors to Tarancon Corporation, Edison, N.J.

Filed Mar. 19, 1985, Ser. No. 713,616

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—255.4 3 Claims



1. The method of treating a surface comprising the steps of providing a gas in contact with the surface to be treated at a first pressure for a period of time, during which a chemical reaction takes place at the surface, reducing the pressure of the gas in contact with the surface to be treated for a second period of time, during which reaction byproduct are removed, re-establishing the first pressure of the gas in contact with the surface for a period of time during which the reaction takes place again, again reducing the pressure of the gas in contact with the surface for a period of time during which reaction byproduct are removed, and continuing the cycle of the first pressure and the reduced pressure until the surface has the desired characteristics.

4,576,838

ANTI-FOULING COATING COMPOSITION, PROCESS FOR APPLYING SAME AND COATING THEREBY OBTAINED

Murray Rosen, Seminole, and Thomas Lane, Lutz, both of Fla., assignors to Marine Shield Corp., St. Petersburg, Fla.

Filed Aug. 15, 1984, Ser. No. 640,972

Int. Cl.[4] B05D *5/00;* C09D *5/14*

U.S. Cl. 427—385.5 30 Claims

24. The process of protecting a surface of an object from fouling by exposure to sea water comprising the steps of applying to said surface a film-forming composition comprising:

(a) 10–22 percent by weight of a hydrophilic component selected from the group consisting of castor oil, partially dehydrated castor oil having a hydroxyl equivalent weight of 600–800, a partially hydrolyzed polyvinylester having a hydroxyl equivalent weight of 300–600, a partially hydrolyzed copolymer of vinyl chloride and vinyl ester having a hydroxyl equivalent weight of 300–600, and a polymer of a monovinyl, monoalphamethylvinyl or monoalphaethylvinyl ether of an alkylene glycol having 2–6 carbon atoms, said polymer having a hydroxyl equivalent weight of 300–600;

(b) 2.5–7.5 percent by weight of a hydrophobic component having no more than 35 carbon atoms therein and having 1–3 urethane groups per molecule;

(c) 30–50 percent by weight of an organic tin polymer of a

monomer having the formula $R_3SnOOCR'$ wherein R is a lower alkyl, cycloalkyl or aryl radical and R' is a polymerizable radical selected from the group consisting of vinyl, lower alkylvinyl, vinyl aryl and lower alkylvinyl aryl groups; and

(d) 20–40 percent by weight of a solvent component having one or more compounds selected from the group consisting of a hydroxyl-containing compound having the formula $R''(OH)_{n'}$ wherein R'' represents an aliphatic, arylaliphatic or cycloaliphatic hydrocarbon group having 2–10 carbon atoms and n' is an integer having a value of 1–3, a monoether or monoester of an alkylene glycol having no more than 10 carbon atoms, an aromatic hydrocarbon having a kauri butanol value of 73–105, and a ketone having no more than 10 carbon atoms;

and allowing said coating to dry to a hard film before the resultant coated surface is exposed to sea water.

4,576,839

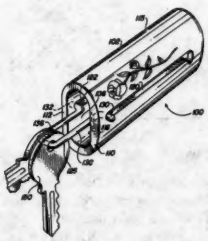
DECORATIVE HOLDER

Joseph R. Parren, 19638 N. 34th Dr., Phoenix, Ariz. 85027

Filed Nov. 19, 1984, Ser. No. 673,143

Int. Cl.[4] A47G *29/10*

U.S. Cl. 428—13 **7 Claims**



1. An ornamental holder for a generally elongate object comprising:

(a) a generally elongate body having a front section and opposite sides defining an opening generally adapted to receive the object;

(b) said front section defining a transparent viewing window having an exterior surface and interior surface with the said interior surface adapted to receive ornamentation, said exterior surface being curved to form a lens to enhance the ornamentation at said interior surface when viewed from the exterior surface.

4,576,840

PILE FABRIC HAVING SHRUNKEN PILE AND NON-SHRINKABLE PILE

Shouichi Murata, Takasago; Muneto Makiyama, Kobe; Takahiro Omoto, Takasago, and Taizo Yasumoto, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1985, Ser. No. 690,905

Claims priority, application Japan, Mar. 27, 1984, 59-60083

Int. Cl.[4] D02G *3/00*; D03D *27/00*

U.S. Cl. 428—16 **5 Claims**

1. A woven or knitted pile fabric having a natural fur-like appearance and having a pile portion formed of a blend of 20 to 98% by weight of shrinkable fibers having a shrinkage of at least 15% and a coefficient of static friction between the shrunk fibers of up to 0.230, said shrinkable fibers having a smoothness imparting finishing agent on the surfaces thereof, and non-shrinkable fibers.

4,576,841

DESICCANT APPLICATION FOR DOUBLE-GLAZED WINDOWS, ETC. AND A SPACER SECTION FILLED WITH THE DESICCANT APPLICATION

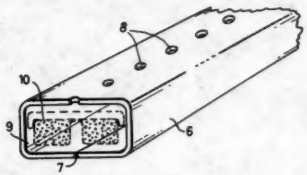
Horst Lingemann, Wuppertal, Fed. Rep. of Germany, assignor to Helmut Lingemann GmbH & Co., Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,196

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143659

Int. Cl.[4] E06B *3/24*

U.S. Cl. 428—34 **8 Claims**



1. A double-glazed window assembly comprising:

a pair of mutually spaced-apart window panes mounted in fixed relation;

a hollow moisture permeable spacing tube laterally disposed between said panes;

a desiccant package inserted in the length of said spacing tube;

said desiccant package comprising a first elongate sheet of ductile airtight material;

plural discrete indentations formed in one face of said first elongate sheet at intervals along the length of the first sheet;

a quantity of desiccant disposed in said indentations;

a second elongate sheet secured to said one face of said first sheet to form the desiccant package and enclosing each said indentation and the desiccant therein, so that the desiccant cannot migrate between indentations along the length of the desiccant package; and

said second elongate sheet being substantially permeable to moisture but being impermeable to the desiccant,

so that the desiccant is retained within the indentations, but moisture entering the spacing tube from between said panes of the double-glazed window can pass through the second sheet for adsorption by the desiccant.

4,576,842

COOKWARE FORMED FROM A LAMINATE

Tyler F. Hartsing, Westfield; Marvin E. Sauers, Belle Mead, and Lloyd M. Robeson, Whitehouse Station, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 19, 1984, Ser. No. 590,791

Int. Cl.[4] B65D *23/00*; B32B *27/36*

U.S. Cl. 428—35 **45 Claims**

1. Cookware made from a laminate, said laminate comprising at least three sheets made from a thermoplastic resin, an inside sheet made from a thermoplastic resin having a higher use temperature than the two outside sheets, said thermoplastic resin selected from a polyarylethersulfone, a poly(aryl ether), polyarylate, polyetherimide, polyester, aromatic polycarbonate, styrene resin, poly(alkyl acrylate), polyhydroxyether, poly(arylene sulfide) and polyamide.

4,576,843

BLOW MOLDED CONTAINERS AND METHOD OF FORMING THE SAME

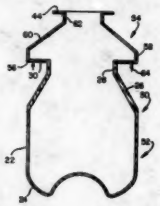
Martin H. Beck, Brookline, and Suppayan M. Krishnakumar, Nashua, both of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Continuation of Ser. No. 324,162, Nov. 23, 1981, Pat. No. 4,496,064. This application Sep. 4, 1984, Ser. No. 646,672

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] B65D *23/00;* B29C *17/12*

U.S. Cl. 428—35 10 Claims



1. An intermediate article of manufacture comprising a blow molded thermoplastic article, said article including a lower portion in the form of a container having a tubular body closed at one end by a bottom of the type shaped to resist internal pressure, an open mouth and a peripheral closure receiving portion at an opposite end of said body, all of said container having a high degree of biaxial orientation with the degree of biaxial orientation of said peripheral closure receiving portion approaching that of said tubular body, and an upper portion in the form of an accommodation element terminating in an open neck portion having substantially no orientation, and said peripheral closure receiving portion being of an outline materially greater than that of said open neck portion.

4,576,844

SHIPPING BAG

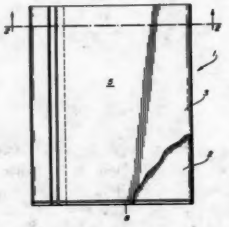
Charles R. Murray, Toronto, and Ray E. Harrison, Brampton, both of Canada, assignors to C-I-L Inc., North York, Canada

Filed Jul. 16, 1984, Ser. No. 631,540

Claims priority, application Canada, Nov. 28, 1983, 442097; Apr. 2, 1984, 451106

Int. Cl.[4] B65D *30/08;* B32B *27/08*

U.S. Cl. 428—35 4 Claims



1. A thermoplastic shipping bag having a front wall and a back wall, each wall comprising a cross-laminated ply comprising at least two sheets of uni-axially oriented polyethylene bonded together; said laminated plies heat sealed one to the other to provide a heat seal area and wherein interposed between said laminated plies in said heat seal area are two layers of low density polyethylene constituting distinct inner plies of the bag, said low density polyethylene plies being heat sealed together and serving as a bridge to permit the effective heat sealing of the laminated plies to each other without significant loss of draw-induced film strength in and around the heat sealed area.

4,576,845

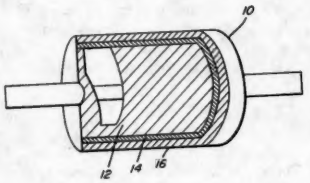
THERMALLY CONDUCTIVE BASE LAYERS FOR CAST POLYURETHANE ROLL COVERS

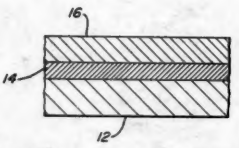
Daniel J. Krotchko, Salisbury, N.C., assignor to KRC Inc., Salisbury, N.C.

Filed Dec. 15, 1983, Ser. No. 561,945

Int. Cl.[4] B21B *1/00;* D21F *0/00*

U.S. Cl. 428—36 8 Claims





1. A pressure roll having a flexible outer cover and adapted for cooperative, contacting engagement with another roll to define a nip area at which the outer cover of the pressure roll is deflected by the cooperating roll, said pressure roll comprising: a hollow metal core member having a cylindrical outer surface; a flexible outer polyurethane cover overlying the outer cylindrical surface of said core member; and an intermediate base layer interposed between said core member and said cover, said intermediate base layer including a polymeric substance and a thermally conductive material, said polymeric substance selected from the group consisting of thermosetting resins and vulcanized rubbers, said intermediate base layer having a thermal conductivity sufficient to conduct heat buildup from said cover to said core member.

4,576,846

FLEXIBLE PLASTIC FOAM WITH A GROOVE- AND TONGUE-LIKE CLOSING SYSTEM

Gert Noel, Hauseter Str. 123, B-4729 Hauset, Belgium

Filed Sep. 6, 1984, Ser. No. 647,801

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332149

Int. Cl.[4] B32B *1/04, 1/08;* F16L *9/00*

U.S. Cl. 428—36 15 Claims

1. A cellular plastic insulating member of a flexible plastic foam material for thermally insulating a conduit, such as a pipe, duct or the like,

said member having a closing line extending longitudinally along the conduit, along which line the facing longitudinal surfaces of the insulating member are joined together,

a closing system located along said closing line and comprising a groove and a tongue, said groove comprising a longitudinally extending groove formed into the material of the member along at least one side of said line, the opening of the groove, viewed in a transverse cross section, being smaller than the dimension across certain inte-

rior portions of the groove, also viewed in transverse cross section,

said tongue of the closing system operatively connected to the side of the closing line other than the side having the groove, the tongue having a portion, viewed in transverse cross section, which is larger than said opening of the

groove, and said tongue being undercut, of smaller dimension closer to the side of the insulating member to which it is operatively connected, such that the tongue and groove snap fit into engagement with each other,

and said tongue being stiffer than the material forming the groove.

4,576,847

THREADED FIBER-REINFORCED PLASTIC MEMBER AND METHOD OF COATING THE SAME

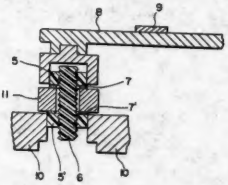
Isao Tajima, Nara, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 13, 1984, Ser. No. 670,896

Claims priority, application Japan, Nov. 14, 1983, 58-213803

Int. Cl.[4] B44C *1/26*; B05D *3/02*

U.S. Cl. 428—67 **11 Claims**



1. A threaded member, comprising a threaded member made of fiber reinforced plastic and a coating of a crosslinked nylon resin on at least the threaded portion of the threaded member.

4,576,848

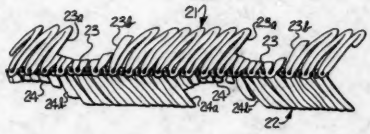
PILE FABRICS AS WOVEN TERRY FABRICS WITH DIAGONAL GROOVES OF CUT PILE

Larry W. Dillon, Ridgeway; Robert L. Jamerson, Collinsville, and Thomas M. Padgett, Martinsville, all of Va., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Jun. 24, 1985, Ser. No. 747,975

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—89 **17 Claims**



14. A terry pile fabric comprising a base fabric, terry pile yarns forming terry pile extending from opposite faces of said base fabric, the terry pile on one face of the base fabric being entirely loop terry pile, the terry pile on the major portion of the opposite face of the base fabric also being loop terry pile having a jacquard pattern provided in the pile, said loop terry pile having a generally common direction of pile lie extending lengthwise of the fabric, the remainder of the terry pile on said opposite face of the fabric being cut terry pile defining diagonal grooves of cut pile extending across the jacquard pattern to impart a sculptured pattern appearance superimposed on the jacquard pattern, each of said diagonal grooves having a substantially vertical side and a sloping opposite side of variable height of pile imparting a sculptured pattern appearance to the terry fabric, and wherein the sloping side of each of the diagonal grooves is positioned downstream of the direction of pile lie.

4,576,849

CURVED COMPOSITE BEAM

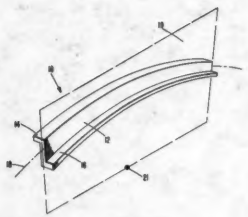
Richard J. Gardiner, Murray, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 501,737, Jun. 6, 1983, Pat. No. 4,512,835.

This application Oct. 31, 1984, Ser. No. 666,589

Int. Cl.[4] E04C *3/46*

U.S. Cl. 428—119 **3 Claims**



1. A structural beam adapted to extend lengthwise along an arc, said beam consisting of a plurality of integrated composite elements contributing to the structural properties thereof, a first of said composite elements dissected by a center plane that intersects said beam longitudinally and contains the center of said arc, the remainder of said elements lying in curved planes intersecting said center plane at said first composite element, said beam comprising:

a composite thermoset resin and fiber core having (a) first and second substantially planar web portions that are integral with each other lengthwise in intimate co-cured relation along said arc and constitute said first composite element and (b) a first flange portion constituting another of said composite elements, said first flange portion being unitary with said first web portion lengthwise along said core in that said first web and flange portions are formed by filament winding them together on a mandrel resulting in filaments of said first flange and web portions extending continuously across said beam these respective edges of said first flange and web portions that are laterally remote each other;

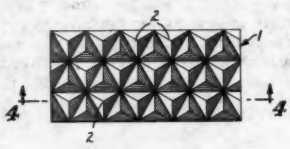
a composite thermoset resin and fiber layer integral with said first flange portion lengthwise in intimate co-cured relation along said core as an overlay on said first flange portion that lies on the surface thereof away from said core, said thermoset resin and fiber layer having continuous filaments extending along lines parallel to said arc.

4,576,850

SHAPED PLASTIC ARTICLES HAVING REPLICATED MICROSTRUCTURE SURFACES

John A. Martens, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 20, 1978, Ser. No. 926,325
Int. Cl.[4] C08G 77/04
U.S. Cl. 428—156 48 Claims



1. An article, useful for an optical purpose, comprising a shaped, plastic, optically homogeneous, cast, monolithic layer having a replicated microstructure-bearing surface whose configuration contains a plurality of utilitarian discontinuities which characterize said optical purpose of said article, said layer comprising crosslinked polymer composed of (1) a plurality of hard segments of mono- or polyvalent moieties containing one or more carbocyclic and/or heterocyclic groups, wherein each of said moieties of said hard segments, when their valences are satisfied by protons, has at least one major transition temperature above 250° K., and (2) a plurality of soft segments of mono- or polyvalent moieties, wherein each of said moieties of said soft segments has a number average molecular weight of about 500 to 5000 and homopolymers thereof have a glass transition temperature below 250° K.

4,576,851

SEMICONDUCTOR SUBSTRATE

Seiichi Iwamatsu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Nagano, Japan

Continuation of Ser. No. 394,070, Jul. 1, 1982, abandoned. This application Apr. 16, 1985, Ser. No. 723,708
Claims priority, application Japan, Jul. 2, 1981, 56-104298; Jul. 24, 1981, 56-116008
Int. Cl.[4] H01L 27/12, 29/06, 21/305, 21/306
U.S. Cl. 428—156 8 Claims

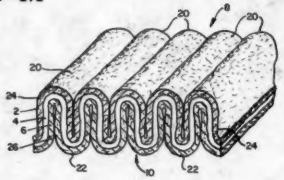
1. A semiconductor substrate, comprising a single-crystal semiconductor material having a planar surface and an island of the semiconductor material projecting from the surface forming a projecting region at an edge of said semiconductor material and an insulating film having an opening for cooperating with the projecting region to form a smooth surface with the top of the projecting semiconductor material at substantially the same level as the surface of the remainder of the insulating film and a single-crystal semiconductor film across the top of the projecting region and the insulating film.

4,576,852

FUSION OF THERMOPLASTIC FABRICS

Kenneth W. Burgess; William R. Bryant, and Wayne K. Erickson, all of Seneca, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1983, Ser. No. 542,962
Int. Cl.[4] B32B 5/14
U.S. Cl. 428—171 44 Claims



1. A method for preparing fused fabric which consists essentially of:

(a) contacting a feed fabric comprising a substantial portion of thermoplastic fibers with a wetting agent consisting essentially of water to form a wetted fabric; and thereafter

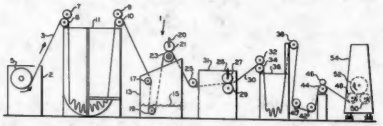
(b) subjecting said wetted fabric to a temperature and a nip pressure along the entire length of the nip sufficient to cause fusion of at least a portion of the fibers along the entire length and width of the feed fabric.

4,576,853

MULTI-LAYER PLEATED TEXTILE FIBER PRODUCT

Edward A. Vaughn, Clemson, S.C., and Michael L. Clymin, Harrisburg, Pa., assignors to C. H. Masland & Sons, Carlisle, Pa.

Continuation-in-part of Ser. No. 550,458, Nov. 10, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,468
Int. Cl.[4] B32B 3/28
U.S. Cl. 428—181 19 Claims



1. A three dimensional structurally stable product comprising a plurality of structurally unstable textile fiber layers pleated together with the layers of each pleat in close contact and with contiguous multi-layer pleats in close contact, the ends of the pleats forming the sides of the product and the folds between pleats forming the upper and lower surfaces of the product.

4,576,854

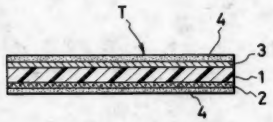
PACKAGING TAPE

Yoshio Kurahashi, Tokyo, Japan, assignor to Nippon Optical Fiber Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,531
Claims priority, application Japan, Jul. 21, 1983, 58-133929; Feb. 8, 1984, 59-20024
Int. Cl.[4] C09J 7/02
U.S. Cl. 428—204 12 Claims

1. A packaging tape for use in packaging or bundling that sticks to intself but not to the packaged or bundled article, said packaging tape comprising a tape-like substrate having two surfaces and a self-adhesive layer formed on both of the surfaces of said substrate, said self-adhesive layer prepared from

an aqueous mixture comprising a water soluble adhesive as an anchoring ingredient to said tape-like substrate, and a rubber latex as a self-adhesive ingredient, which ingredients are mixed with each other in a weight ratio of said water-soluble adhesive to rubber latex within the range between 0.48 and 1.80, whereby said self-adhesive layers firmly bond to each other at an overlapped area between mated layers when the tape is



wound around an article to be packaged or bundled, thereby preventing the mated tape layers from unwinding and separating from each other, said self-adhesive layers being non-tacky to the surface of the article in contact with said self-adhesive layers thereby enabling said layers to be freely removed from the surface of the article packaged or bundled upon unwinding the tape.

4,576,855

COATING COMPOSITION AND SKINNED POLYURETHANE FOAM ARTICLES COATED THEREWITH

Toyohiko Okina, Anjo; Hiroshi Goto, Gifu; Akimasa Ozawa, Ichinomiya; Kenji Nakamura, Hirakata, and Hiroshi Oishi, Kyoto, all of Japan, assignors to Inoue MTP Co., Ltd., Nagoya and Sanyo Chemical Industries, Ltd., Kyoto, both of Japan

Filed Jun. 16, 1983, Ser. No. 504,736

Claims priority, application Japan, Jul. 22, 1982, 57-128375

Int. Cl.⁴ B32B *3/26, 7/10, 27/40*

U.S. Cl. 428—215 **23 Claims**

1. A coating composition, which comprises a combination of:

[I] a two component type non-yellowing polyurethane solution, for top coat, comprising (a) at least one OH-terminated urethane prepolymer having a hydroxyl-equivalent of at least 1,400 derived from at least one non-aromatic polyisocyanate and excess of at least one polyol, and (b) at least one non-aromatic polyisocyanate; and

[II] a two component type polyurethane, for under coat, comprising (c) at least one NCO-terminated urethane prepolymer derived from at least one polyol and at least one aromatic polyisocyanate, and (d) at least one polyol.

14. The composition of claim 1, wherein [I] is used in such amount providing a top coat layer having an average thickness of 0.01–0.1 mm, and [II] is used in such amount providing an under coat layer having an average thickness of 0.05–3 mm.

4,576,856

RECONSTITUTED MICA MATERIALS, RECONSTITUTED MICA PREPREG MATERIALS, RECONSTITUTED MICA PRODUCTS AND INSULATED COILS

Hideji Kuwajima, and Takeyoshi Watanabe, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 319,076, Nov. 6, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,461

Claims priority, application Japan, Nov. 19, 1980, 55-163846; Oct. 8, 1981, 56-161508

The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.

Int. Cl.⁴ B32B *19/04*

U.S. Cl. 428—241 **15 Claims**

1. A reconstituted mica material produced by sheet forming a slurry containing mica flakes prepared by disintegrating unfired mica and comprising:

(i) 2 to 25 parts by weight of mica flakes having a particle size of 1.7 mm or more and an aspect ratio of 150 or more,

(ii) 20 to 60 parts by weight of mica flakes having a particle size of 1.0 mm or more and less than 1.7 mm and an aspect ratio of 150 more,

(iii) 20 to 40 parts by weight of mica flakes having a particle size of 0.25 mm or more and less that 1.0 mm and an aspect ratio of 100 or more, and

(iv) 10 to 30 parts by weight of mica flakes having a particle size of less than 0.25 mm and an aspect ratio of 100 or more; said reconstituted mica material exhibiting a flexural strength of 1580 kgf/cm^2 or more, a dielectric breakdown strength of 104 kV or more and a dielectric breakdown strength after deterioration of 92 kV or more when formed into a prepreg material.

4,576,857

MELT-FUSIBLE POLYIMIDES

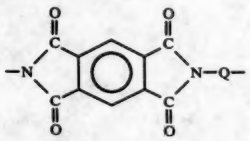
Thomas P. Gannett, and Hugh H. Gibbs, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 475,034, Mar. 14, 1983, abandoned. This application Sep. 21, 1983, Ser. No. 534,208

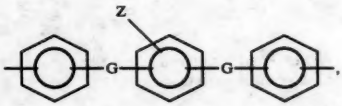
Int. Cl.⁴ B32B *27/28;* **C07C** *93/14, 149/42;* **C08G** *73/10*

U.S. Cl. 428—260 **44 Claims**

1. A substantially void-free composite structure consisting essentially of a fibrous substrate impregnated with a melt-fusible polyimide containing up to about 10% of end-capped amino or anhydride groups and consisting essentially of the following repeating units:

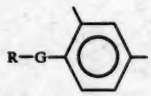


where Q in each repeating unit, independently of any other unit, is a divalent organic radical selected from the following:



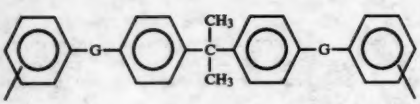
(a)

where G is O or S; and Z is hydrogen or phenyl; and, when Z is hydrogen, both terminal covalent bonds are either in the ortho or meta position with respect to G; while, when Z is phenyl, both terminal covalent bonds are in ortho, meta, or para position with respect to G;



(b)

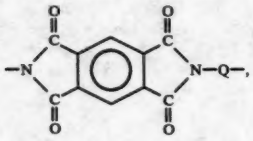
where G is O or S; and R is phenyl, biphenyl, or naphthyl; and



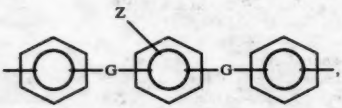
(c)

where G is O or S.

16. A melt-fusible polyimide consisting essentially of the following repeating units

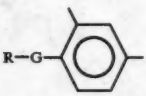


where Q in each repeating unit, independently of any other unit, is a divalent organic radical selected from the following:



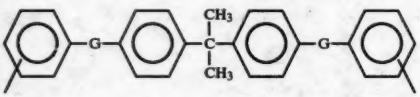
(a)

where G is O or S, and Z is hydrogen or phenyl; and, when Z is hydrogen, both terminal covalent bonds are either in the ortho or meta position with respect to G; while, when Z is phenyl, both terminal covalent bonds are in ortho, meta, or para position with respect to G;



(b)

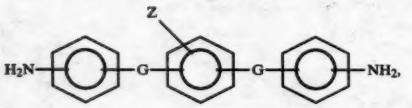
where G is O or S; and R is phenyl, biphenyl, or naphthyl; and



(c)

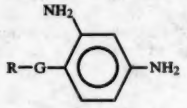
where G is O or S and both terminal covalent bonds are in the ortho or meta position with respect to G.

34. A solution in a polar solvent of a pyromellitic diester diacid and of a diamine, either component being present in a 0–10% molar excess, the diamine being either a single species or more than one species selected from the following classes (a) through (c):



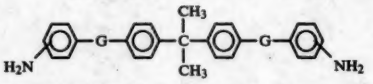
(a)

where G is O or S, and Z is hydrogen or phenyl; and, when Z is hydrogen, both terminal amine groups are either in the ortho or meta position with respect to G; while, when Z is phenyl, both terminal amine groups are in ortho, meta, or para position with respect to G;



(b)

where G is O or S; and R is phenyl, biphenyl, or naphthyl; and



(c)

where G is O or S, and both amine groups are in the ortho or meta position with respect to G.

41. A diamine selected from the class consisting of:
1,4-bis(4-aminophenoxy)-2-phenylbenzene;
2-(2,4-diaminophenoxy)biphenyl; and
4-(2,4-diaminophenoxy)biphenyl.

4,576,858

MATERIAL BASED ON A NON-WOVEN TEXTILE LAP WHICH MAY BE USED AS REINFORCEMENT FOR IMPERMEABLE COVERINGS

André Fourezon, Le Cheylard, France, assignor to Etablissements les Fils d'Auguste Chomarat et Cie, Paris, France

Filed Mar. 29, 1985, Ser. No. 717,867
Claims priority, application France, Apr. 6, 1984, 84 05693
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—300 **4 Claims**

1. A material which may be used as reinforcement for bituminous impermeable coverings of the type constituted by a non-woven fibrous lap,

said lap being formed by a complex comprising an intermediate layer constituted by a non-woven fabric of polyester, said non-woven fabric serving as a support for glass fibers implanted therein, said fibers projecting on each side of said non-woven fabric and folded back thereon.

4,576,859

RADIO WAVE SHIELDING MATERIALS AND A METHOD OF PRODUCING THE SAME

Tomio Oyachi, Tokorozawa; Hiroya Fukuda, Yokohama, and Masahiko Anami, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,657
Claims priority, application Japan, Oct. 21, 1983, 58-196022
Int. Cl.[4] B32B *3/24*
U.S. Cl. 428—311.1 **12 Claims**

1. A radio wave shielding material comprising a plastic foamed body having a three-dimensional network skeleton structure and provided on its skeleton surface with a metal plating coat, and a coating of a conductive rubber and/or plastic formed on said metal plating coat.

4,576,860

FOAM LAMINATE FOIL OR WEB AND PROCESS FOR PREPARING SAME

Roland Fink, Ebenhausen; Maximilian Mayr, Garching, and Dieter Schlenz, Egling, all of Fed. Rep. of Germany, assignors to Alkor GmbH Kunststoffe, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,577

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429523

Int. Cl.[4] B32B *3/26, 27/08*

U.S. Cl. 428—314.4 30 Claims

1. A delamination resistant foam laminate, comprising:

an unfoamed top layer having a thickness of greater than about 20 μ m and comprising a styrene-acrylonitrile copolymer grafted with at least one polyfunctional acrylate and containing at least one additional polymer selected from the group consisting of chlorinated polyethylenes, ethylene-propylene mixed polymers and a terpolymer of ethylene, propylene and a diene, the weight ratio of said grafted styrene-acrylonitrile copolymer to said at least one additional polymer being from about 8:2 to about 3:7;

a polyolefin foam bottom layer comprising at least one polymer selected from the group consisting of closed pore polyethylene foams and closed pore ethylene-propylene copolymer foams, the bulk density of said bottom layer being greater than 10 kg/m^3; and

an intermediate layer arranged between said top and bottom layers and acting as a coupling agent, said intermediate layer comprising a mixture of a polar group-containing low pressure polyethylene, a polar group-containing ethylene-vinly ester copolymer and at least one additional polymer selected from the group consisting of rubber-like ethylene-propylene mixed polymers and rubber-like terpolymers of ethylene, propylene and a diene.

4,576,861

MATERIAL FOR GASEOUS DIFFUSION ELECTRODE

Hiroshi Kato, Wake, Japan, assignor to Junkosha Co. Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,312

Claims priority, application Japan, Feb. 27, 1984, 59-34427

Int. Cl.[4] B32B *3/26, 5/30, 5/32*

U.S. Cl. 428—316.6 10 Claims

1. A composite material for use as a gas diffusing electrode comprising:

(a) a first layer comprising a sheet of expanded, porous PTFE having nodes interconnected by fibrils and having an initial thickness, said first layer containing a powdered, electroconductive substance therein, and

(b) a second layer comprising a sheet of pure, expanded, porous PTFE having nodes interconnected by fibrils and having an initial thickness,

said second layer being more highly porous than said first layer and being bonded to and integrated with said first layer, the thickness of said composite material being less than the combined initial thicknesses of said first and second layers, a portion of said nodes and fibrils of said first and second layers being interconnected and intertwined to form said bond between the layers.

4,576,862

POLYIMIDE LAMINANT AND PROCESS FOR THE PREPARATION OF SAME

Raymond Lee, Elk Grove Village, and Gregory A. Ferro, Mt. Prospect, both of Ill., assignors to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Jul. 15, 1985, Ser. No. 754,774

Int. Cl.[4] B32B *3/26, 27/08*

U.S. Cl. 428—317.7 24 Claims

1. A laminate having improved vapor barrier properties comprising:

(a) a polyimide foam prepared by forming a prepolymer formed from (1) an organic tetracarboxylic acid or anhydride or ester derivative, (2) an aromatic diamine having the formula:

$$H_2N—R_2—NH_2$$

wherein R_2 is an aromatic group containing 5 to 16 carbon atoms, and (3) an organic liquid diamine containing at least 50% by weight of a conjugated diene, said foam having a vapor impermeable skin on one surface thereof formed by heating one surface of the foam to coalesce the polyimide on the surface;

(b) a fire-resistant, heat-activated adhesive layer overlaying the skin; and,

(c) a polyimide film adhered to said skin by said adhesive.

4,576,863

COMPOSITE MATERIAL AND PROCESS FOR ITS PRODUCTION

Tadashi Donomoto; Mototsugu Koyama; Yoshio Fuwa; Nobuhiro Miura, all of Toyota, and Tatsuo Sakakibara, Ueda, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Art Kinzoku Kogyo Kabushiki Kaisha, Tokyo, both of Japan

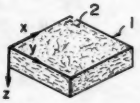
PCT No. PCT/JP81/00399, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01960, PCT Pub. Date Jun. 9, 1983

PCT Filed Dec. 18, 1981, Ser. No. 515,050

Claims priority, application Japan, Nov. 30, 1981, 56-191919

Int. Cl.[4] B32B *5/16, 15/04*

U.S. Cl. 428—325 4 Claims



1. A composite material comprising a matrix of a metal selected from a group consisting of aluminum, magnesium and their alloys, and reinforcing members of an assemblage of alumina-silica fibers containing not less than 40 wt.% alumina, said assemblage of alumina-silica fibers having a virtual density of 0.08–0.3 g/cm^3 and including present in an amount of not more than 17 wt.%, nonfibered particles of the same material as the fibers whereas not more than 7 wt.% nonfibered particles are not smaller than 150 microns diameter.

4,576,864

WATER SPREADING PLASTIC MATERIAL, METHOD FOR ITS MANUFACTURE AND ITS USE AS A GLAZING AND ROOFING MATERIAL

Jürgen Krautter, Darmstadt, and Willi Dzialas, Griesheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,608

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400079

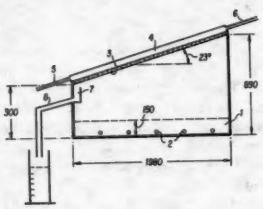
Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—328 24 Claims

1. A water-spreading plastic material, comprising a plastic base having a water-repellent surface and having coated thereon:

(1) an adhesive comprising a non-water-soluble, organic solvent soluble and essentially non-swellable polar group containing polymer and,

(2) a water-spreading layer adhered to said base by said adhesive, being composed of colloid particles selected from the



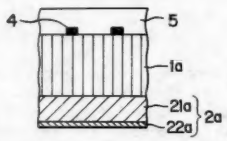
group consisting of silicon oxide, a metallic oxide and a mixture thereof.

4,576,865

MATERIALS FOR PACKAGING LIGHT-SENSITIVE MATERIALS

Mutsuo Akao, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 12, 1983, Ser. No. 541,349
Claims priority, application Japan, Oct. 13, 1982, 57-178289
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—335 **22 Claims**



1. A material for packaging light-sensitive materials including a composite sheet which is a laminate of a substrate and at least one thermoplastic resin layer, at least one layer of said sheet having light-shielding properties,

wherein said thermoplastic resin layer is prepared by the process of melt coextruding a surface layer and an intermediate layer;

said surface layer being comprised of thermoplastic polyolefin resin selected from the group consisting of low density polyethylene, medium density polyethylene, high density polyethylene, linear low density (L-LDPE), ethylene copolymer other than L-LDPE which contain no less than 95 mol % of ethylene, polypropylene and mixtures thereof,

said intermediate layer having a thickness of at least 4 microns and being heat sealable and being comprised of one or more copolymers selected from:

(a) copolymer including 7–30 mol % acrylic ester and/or methacrylic ester with the balance being ethylene provided that the ester is comprised of an alkyl group having 1–8 carbon atoms, and

(b) an ethylene vinyl acetate copolymer (EVA) including 7–20 mol % of vinyl acetate with the balance being ethylene.

4,576,866

MAGNETIC RECORDING MATERIAL

Tsutomu Okita; Nobuo Tsuji, and Yoshito Mukaida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 23, 1984, Ser. No. 592,671
Claims priority, application Japan, Mar. 25, 1983, 58-48761
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—336 **8 Claims**

1. A magnetic recording material, comprising:

a support base having thereon;

a magnetic layer comprised of ferromagnetic powder dispersed in a binder, the binder comprised of a compound selected from class (A), a compound selected from class (B) and a compound selected from class (C), the magnetic layer having been irradiated with electron beams;

class (A) consists of vinyl chloride-vinyl acetate-based copolymers containing 5×10^{-5} to 1.7×10^{-3} equivalents of $-CO_2H$ groups per 1 g of copolymer;

class (B) consists of urethane acrylates having two or more acryloyl groups or methacryloyl groups per molecule and a number average molecular weight in the range of 500 to 100,000, with the urethane being synthesized using a polyester polyol as a starting material which contains a polyhydric alcohol component containing 0 to 10 mole % of a polyhydric alcohol having 3 or more hydroxyl groups and a polybasic component containing 0 to 10 mole % of a polybasic acid having 3 or more carboxyl groups, wherein at least 50 mole % of the polyhydric alcohol component is selected from the group consisting of dihydric alcohols of the group (I) and/or at least 50 mole % of the polybasic component is selected from the group consisting of dibasic acids of the group (II):

group (I) consists of alkyl-substituted aliphatic dihydric alcohols, alicyclic dihydric alcohols, and dihydric alcohols made by addition of alkylene oxide to an alcohol selected from the group consisting of alicyclic dihydric alcohols and aromatic dihydric alcohols;

group (II) consisting of alicyclic dicarboxylic acids, and aromatic dicarboxylic acids;

class (C) consists of compounds having a molecular weight of 500 or less and which contain two or more acryloyl groups or methacryloyl groups per molecule, wherein the ratio of compounds of class (B) to the compounds of class (C) is in the range of form 40/60 to 95/5 by weight, wherein the ratio of compounds of class (A) to the total of the compounds of class (B) and class (C) is in the range of 30/70 to 80/20 by weight, wherein the ferromagnetic powder is dispersed in the binder in an amount of 2 to 7 parts by weight per part by weight of the binder, wherein the magnetic layer has a thickness in the range of 2 to 8 μm and wherein the magnetic layer is irradiated with electron beams having an acceleration voltage in the range of 100 kV to 1,000 kV to apply an absorption dose in the range of 0.5 to 20 megarads.

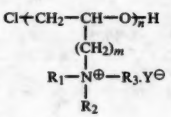
4,576,867

INK JET RECORDING PAPER

Shigehiko Miyamoto, Kamagaya, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,928
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—342 **16 Claims**

1. An ink jet recording paper, wherein a cationic resin having a structure represented by the following general formula (I):



(I)

wherein R_1, R_2 and R_3 represent alkyl group, m represent a

number of 1 to 7, n represents a number of 2 to 20, and Y represents an acid residue, is attached to at least the surface of said ink jet recording paper.

4,576,868

COATING COMPOSITION PROCESS FOR THE PREPARATION OF COATINGS AND COATED SUBSTRATE

Ulrich Poth, Munster, and Hans-Dieter Hille, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 651,274

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333072

Int. Cl.[4] C08K *3/04;* **C08L** *67/00;* **B32B** *27/00;* **B05D** *1/36*

U.S. Cl. 428—423.1 **14 Claims**

1. A coating composition for the preparation of the base coat of a multilayer enamel consisting of at least one base and one transparent protective coat, the said coating composition containing binders based on organic resins, metallic pigments, organic solvents and, if appropriate, other pigments as well as customary additives and auxiliaries, wherein the binders consist of the following components:

A. 20 to 60% by weight of one or more polyurethane and/or urea elastomers prepared from

(a_1) linear compounds with terminal hydroxyl and/or primary and/or secondary amino groups and

(a_2) aliphatic and/or cycloaliphatic diisocyanates, the molar ratio of a_1 to a_2 being 0.8:1 to 1.5:1,

B. 10 to 50% by weight of one or more polyesters prepared from

(b_1) aromatic and aliphatic and/or cycloaliphatic polycarboxylic acids, 40 to 70 mol % of the polycarboxylic acids being aromatic and 60 to 30 mol % of the polycarboxylic acids being aliphatic and/or cycloaliphatic, and 0 to 50 mol % of the total polycarboxylic acids being tricarboxylic acids, and

(b_2) polyols,

20 to 60 mol % of the polyols having 2 or 3 carbon atoms and 40 to 80 mol % having 4 or more carbon atoms,

at least 40 mol % of the diols used having aliphatic side-chains,

0 to 50 mol % of the polyols being triols and

the ratio of the components b_1 and b_2 corresponding to the following formula

$$K = \frac{n_1 - n_2 (F - 2)}{n_2}$$

in which n_1 denotes the number of mol of polyols, n_2 denotes the number of mol of polycarboxylic acids, F denotes the average molar value of the functionality of the polycarboxylic acids and K has a value of 1.05 to 1.5, and

C. 5 to 25% by weight of polycondensates partially etherified with monoalcohols ahd consisting of melamine, benzoguanamine and/or urea with formaldehyde, the molar ratio of melamine to formaldehyde in the case of melamine/formaldehyde resins being 1:4.5 to 1:6 and the molar ratio of benzoguanamine or urea to formaldehyde in the case of benzoguanamine/formaldehyde or urea/formaldehyde resins being 1:2.5 to 1:4, and the sum of the components A, B and C being 100%.

7. A process for the preparation of coatings, in which a coating composition containing metallic pigments for the formation of a base coat is applied to a substrate, this being followed, after a period of exposure to the air, by the application according to the wet-in-wet process of a second coating composition forming a transparent protective coat, wherein the binders of the coating composition for the base coat consist of the following components:

A. 20 to 60% by weight of one or more polyurethane and/or urea elastomers prepared from

(a_1) linear compounds with terminal hydroxyl and/or primary and/or secondary amino groups and

(a_2) aliphatic and/or cycloaliphatic diisocyanates, the molar ratio of a_1 to a_2 being 0.8:1 to 1.5:1,

B. 10 to 50% by weight of one or more polyesters prepared from

(b_1) aromatic and aliphatic and/or cycloaliphatic polycarboxylic acids, 40 to 70 mol % of the polycarboxylic acids being aromatic and 60 to 30 mol % of the polycarboxylic acids being aliphatic and/or cycloaliphatic, and 0 to 50 mol % of the total polycarboxylic acids being tricarboxylic acids, and

(b_2) polyols,

20 to 60 mol % of the polyols having 2 or 3 carbon atoms and 40 to 80 mol % having 4 or more carbon atoms,

at least 40 mol % of the diols used having aliphatic side-chains,

0 to 50 mol % of the polyols being triols and

the ratio of the components b_1 and b_2 corresponding to the following formula

$$K = \frac{n_1 - n_2 (F - 2)}{n_2}$$

in which n_1 denotes the number of mol of polyols, n_2 denotes the number of mol of polycarboxylic acids, F denotes the average molar value of the functionality of the polycarboxylic acids and K has a value of 1.05 to 1.5, and

C. 5 to 25% by weight of polycondensates partially etherified with monoalcohols and consisting of melamine, benzoguanamine and/or urea with formaldehyde, the molar ratio of melamine to formaldehyde in the case of melamine/formaldehyde resins being 1:4.5 to 1:6 and the molar ratio of benzoguanamine or urea to formaldehyde in the case of benzoguanamine/formaldehyde or urea/formaldehyde resins being 1:2.5 to 1:4, and the sum of the components A, B and C being 100%.

4,576,869

TETRAFLUOROETHYLENE FINE POWDER AND PREPARATION THEREOF

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1984, Ser. No. 621,798

Int. Cl.[4] C08F *114/26*

U.S. Cl. 428—502 **3 Claims**

1. A non-melt-fabricable tetrafluoroethylene polymer prepared by the aqueous dispersion polymerization procedure in which the last portion of the polymerization is slowed down by stopping addition of initiator so that the end point is at least 5% longer than if initiator addition is continued to the end of the reaction characterized in that

(a) the primary particle size is between 0.1 and 0.5 microns;

(b) the standard specific gravity is less than 2.190,

(c) the rheometric pressure is at least 250 kg/cm^2,

(d) the uniformity of stretch is at least 75% throughout a lubricant loading range of 4 weight percent which 4 weight percent range is within a lubricant loading level range between 10 and 25 weight percent, at a stretch rate of 100%/second,

(e) the uniformity of stretch is at least 75% throughout a stretch rate of between 10 and 100%/second at a lubricant loading level of 17%, and

(f) the stress relaxation time is at least 400 seconds.

4,576,870

METHOD FOR MAKING MULTILAYERED RESIN BODIES HAVING UV-PROTECTION AND THE RESULTANT PRODUCTS

Ralf Liebler, Darmstadt; Siegmund Besecke, Seeheim-Jugenheim, and Manfred Munzer, Bensheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,326

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312611

Int. Cl.[4] B32B *27/08, 31/30;* B29C *47/06*

U.S. Cl. 428—515 16 Claims

1. A method for making a formed multilayer synthetic resin body having at least one layer which is to be protected from incident ultraviolet light and at least one protective layer which absorbs incident ultraviolet light, which method comprises coextruding said body from a plurality of thermoplastic molding compounds, said protective layer being formed by extrusion of a first molding compound comprising from 51 to 100 percent by weight of a copolymer having polymerized therein at least one comonomer the molecule of which contains a group or structure which protects against ultraviolet light because of its characteristic absorption of ultraviolet light.

15. A formed multilayer synthetic resin body made by the method of claim 1.

4,576,871

HEAT-RECOVERABLE ARTICLE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,605

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307567

Int. Cl.[4] B32B *27/32*

U.S. Cl. 428—521 9 Claims

1. A heat-recoverable article comprising:

an outer layer of an opaque, dimensionally stable, thermoplastically deformable material and

a colored inner layer of a cross-linked heat-recoverable material having a characteristic recovery shrinkage temperature,

said outer layer having the property of being non-transparent below the shrinkage temperature and of becoming transparent at a decrystallization temperature at least as high as said shrinkage temperature whereby said inner layer becomes visible through said outer layer when the article is heated to said decrystallization temperature.

4,576,872

FRICTION ELEMENT AND METHOD OF MANUFACTURE THEREOF

Melvyn Ward, Redditch, Great Britain, assignor to Lucas Industries, Birmingham, England

Filed Feb. 17, 1984, Ser. No. 581,320

Claims priority, application United Kingdom, Feb. 24, 1983, 8305189

Int. Cl.[4] B22F *3/14, 3/16*

U.S. Cl. 428—550 11 Claims

1. A friction element comprising a sintered substrate formed of metallic friction material containing sintered metal particles and at least one friction modifier; and a surface layer having a thickness of up to about 2 mm on said sintered substrate and defining a friction surface of the friction element; said surface layer being formed of a metallic friction material containing at least one friction modifier and metal particles which are unsintered or sintered over substantially the whole of said friction surface to a lesser extent than said friction material of said sintered substrate so that said surface layer has less wear resistance than said sintered substrate and friction properties which are not substantially less than those of said sintered substrate.

5. A method of manufacturing a friction element comprising the steps of disposing in a resistance sintering die (1) at least one layer of powdered metallic friction material which (a) contains sinterable metallic particles and at least one friction modifier and (b) is destined to form a sintered friction material substrate of the friction element and (2) a surface layer of powdered metallic friction material which (a) contains metallic particles and at least one friction modifier and (b) is destined to form a friction material surface layer of the friction element; and subjecting said layers of powdered metallic friction material to a resistance sintering operation at a pressure and temperature such as to sinter said sinterable metallic particles of said at least one layer of powdered metallic friction material whereby said sintered substrate and said surface layer of the friction element having a thickness of up to 2 mm are produced, wherein said surface layer of powdered metallic friction material which is destined to form said surface layer of the friction element is formulated so as to be unsinterable or only partially sintered under said pressure and temperature whereby said surface layer of the friction element has less wear resistance than said sintered substrate and frictional properties which are not substantially less than those of said sintered substrate.

4,576,873

HOMOGENEOUS, DUCTILE IRON BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeCristofaro, Chatham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 652,167, Sep. 19, 1984, Pat. No. 4,515,870, which is a continuation of Ser. No. 515,678, Jul. 21, 1983, abandoned, which is a continuation of Ser. No. 285,884, Jul. 22, 1981, abandoned. This application Feb. 19, 1985, Ser. No. 702,778

Int. Cl.[4] B22F *5/00*

U.S. Cl. 428—606 3 Claims

1. For use as a surface layer a hardfaced metal article, a homogeneous ductile hardfacing foil composed of metastable material having at least 50 percent glassy structure and a composition consisting essentially of 0 to about 25 atom percent cobalt, 0 to about 30 atom percent nickel, 0 to about 30 atom percent chromium, 0 to about 5 atom percent tungsten, 0 to about 4 atom percent molybdemum, about 4 to about 25 atom percent boron, 0 to about 15 atom percent silicon, and 0 to about 5 atom percent carbon, the balance being iron plus incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent.

4,576,874

SPALLING AND CORROSION RESISTANT CERAMIC COATING FOR LAND AND MARINE COMBUSTION TURBINES

Charles J. Spengler, Murrysville Boro, and Graham A. Whitlow, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

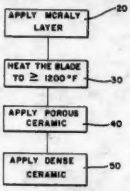
Filed Oct. 3, 1984, Ser. No. 657,421

Int. Cl.[4] B21D *39/00;* C03C *27/02*

U.S. Cl. 428—623 15 Claims

8. In a turbine blade of the type for use in a land-based or marine combustion turbine and having an airfoil of which at

least a portion is designed to operate in the 1100°–1500° F. temperature range and being designed to be usable with contaminated fuels, the improvement comprising:



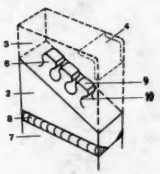
a 1–4 mil thick ceramic coating on at least the portion of said blade designed to operate in the 1100°–1500° F. temperature range, said ceramic coating having been applied in a manner such that it remains in compression up to a temperature of at least about 1200° F.

4,576,875

WELDABLE WEAR PART WITH HIGH WEAR RESISTANCE

Olle G. Olsson; Melih Yaman, both of Sandviken; Mats G. Waldenström, Sundbyberg, and Udo K. R. Fischer, Vallingby, all of Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Jun. 17, 1981, Ser. No. 274,627
Claims priority, application Sweden, Jun. 23, 1980, 8004608
Int. Cl.⁴ B32B *15/18;* **B22D** *19/04, 19/06;* **B02C** *23/00*
U.S. Cl. 428—627 **10 Claims**



1. Wear part with high wear and abrasion resistance combined with good weldability and good mechanical strength or toughness, comprising a composite part of hard metal portion, a cast iron body portion and a joining portion, characterized in that the joining portion consists essentially of a weldable steel which by casting is bonded to the cast iron body portion by a combined mechanical-metallurgical bond.

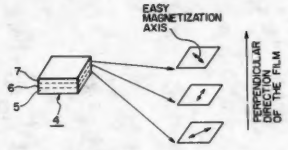
4,576,876

MAGNETIC RECORDING MEDIUM

Kazuo Shiiki, Tsukui; Yoshihiro Shiroishi, Hachioji; Osamu Kitakami, and Yasutaro Uesaka, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Maxell, Ltd., Ohsaka, both of Japan

Filed Sep. 19, 1984, Ser. No. 651,937
Claims priority, application Japan, Sep. 19, 1983, 58-171375
Int. Cl.⁴ G11B *5/66*
U.S. Cl. 428—679 **16 Claims**

1. A complex, magnetic recording medium comprising a substrate, an underlayer provided directly or indirectly on said substrate, said underlayer including at least one magnetic film with high permeability, and a recording medium layer provided directly or indirectly on said underlayer, said underlayer



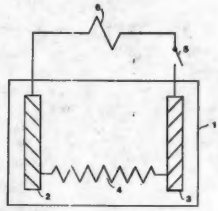
having a relative permeability of not less than 800 in all directions of the film surface.

4,576,877

FUEL CELL

Marinus Alfenaar, Schinnen, Netherlands, assignor to Electrochemische Energieconversie N.V., Mol, Belgium

Filed Jan. 11, 1985, Ser. No. 690,621
Claims priority, application Netherlands, Jan. 14, 1984, 8400127
Int. Cl.⁴ H01M *8/02, 8/18*
U.S. Cl. 429—12 **11 Claims**



1. A fuel cell comprising:
an anode;
a cathode; and
at least one electrically conductive member wherein
the anode is connected with the cathode within said fuel cell through at least one said electrically conductive member and
the arithmetic product of the total electrical resistance between the anode and the cathode electrically conductive connected together within said fuel cell, measured in Ω and the active area of the cathode in m^2, lies between 10^{-4} and 10 Ωm^2.

4,576,878

METHOD AND APPARATUS FOR REBALANCING A REDOX FLOW CELL SYSTEM

Randall F. Gahn, Columbia Station, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

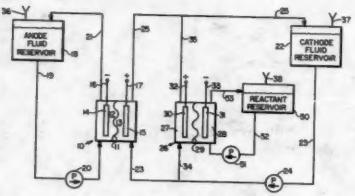
Filed Jun. 25, 1985, Ser. No. 748,536
Int. Cl.⁴ H01M *8/04*
U.S. Cl. 429—15 **15 Claims**

1. In a REDOX system including a REDOX cell having an anode chamber and a cathode chamber separated by an ion exchange membrane with an inert electrode in each chamber and anode and cathode fluids each of which includes the same two species of metal chlorides in aqueous HCl, the active metal ions in each fluid being determined by the charging voltage applied between the electrodes of the REDOX cell, the improvement comprising:

a rebalance cell having a cathode chamber and a chlorine

reactant chamber separated by an ion permeable membrane with an inert electrode in each chamber; means for directing the cathode fluid of the REDOX cell through the cathode chamber of the rebalance cell;

a supply of reactant fluid comprised of said two species of metal chlorides in aqueous HCl;



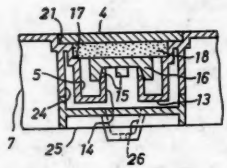
means for circulating said reactant fluid through said reactant chamber while said electrode in said reactant chamber is negative with respect to said electrode in the cathode chamber whereby the active metal ions in the cathode chamber are reduced while chlorine ions in the reactant chamber are oxidized to chlorine gas.

4,576,879

SEALED LEAD ACID BATTERY

Masao Nakazawa, Takatsuki; Michio Yashima, Kawagoe, and Shuuji Takahashi, Ooi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Takatsuki, Japan

Filed Oct. 10, 1984, Ser. No. 659,471
Int. Cl.[4] H01M 2/12
U.S. Cl. 429—86 **3 Claims**



1. A sealed lead acid battery comprising:

(a) a container having a rectangular base, four side walls approximately perpendicular to said base and a plurality of vertical partitions dividing said container into a series of separate chambers, said container being formed from a polypropylene resin containing 5 to 20% inert filler and having a wall thickness of 2 to 4 millimeters;

(b) a plurality of cell elements inserted into said chambers, each cell element consisting of at least one rectangular negative plate and at least one rectangular positive plate, arranged serially, each plate being separated from the next by a rectangular, microfibrous, glass separator, having a length and a width greater than that of said plates, said cell elements being pressed into said chamber so as to have an enforceable positive pressure on said negative and positive plates of between 35 and 60 kg/cm^2;

(c) a plurality of straps, connecting the positive and negative plates of each cell respectively;

(d) a cover body sealed to said container, said cover body having a plurality of filler ports, a negative terminal, a positive terminal, and a gas collection system consisting of a common manifold, venting passages connecting said manifold to openings in the top of each of said chambers, a common vent, said vent being formed in a recess in the surface of said cover and comprising a cylindrical, small diameter tube projecting vertically from said common manifold, a plurality of notches formed in the upper portion of said tube, and an elastic cap vertically and horizontally covering said upper tube portion;

(e) a gas permeable filter, fixedly arranged in said vent, superimposed upon and restraining said elastic cap of said common vent; and

(f) a loosely fitting cover detachably mounted upon said cover body over said filter,

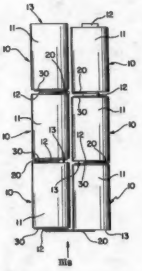
wherein said elastic cap positively seals the upper tube portion, and said elastic cap is arranged with said upper tube portion to release gas through said filter by opening of said elastic cap, by itself, when the gas pressure within the common manifold is between 0.2 to 0.4 kg/cm^2 above ambient atmospheric pressure.

4,576,880

BATTERY PACK

Alain Verdier, Ste Foy les Lyon, and Gilbert Charton, Dardilly, both of France, assignors to Black & Decker Inc., Newark, Del.

Filed Apr. 3, 1985, Ser. No. 719,320
Claims priority, application France, Apr. 6, 1984, 84 05471
Int. Cl.[4] H01M 2/10
U.S. Cl. 429—99 **12 Claims**



1. A battery pack, comprising:

a casing having a closed bottom, opposed side walls, and an open top;

said closed bottom having two access orifices therein;

each of said opposed side walls having an aperture therein adjacent said closed bottom;

a plurality of rechargeable batteries in said casing connected in a series arrangement with opposite poles of the series arrangement being located adjacent said closed bottom in alignment with said access orifices;

two contact strips each having a portion externally of said casing, said contact strips connected to contact flanges extending into said casing through a respective one of the apertures, each contact flange extending parallel to said closed bottom and over one of said access orifices and being rigidly secured to a respective one of said poles; and

a cover closing said open top and secured to said casing, said cover pressing said series arrangement of batteries towards said contact flanges to prevent movement of said series arrangement in said casing.

4,576,881

ELECTROCHEMICAL STORAGE CELL

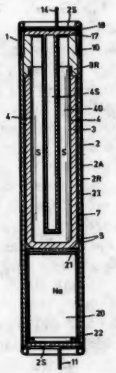
Dieter Hasenauer, Weinheim, and Kuno Hug, Heidelberg, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,872

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340264

Int. Cl.[4] H01M *10/39*

U.S. Cl. 429—104 8 Claims



1. Electrochemical storage cell based on alkali-metal and sulfur with at least one anode space and a cathode space which are separated from each other by an alkali-ion-conducting solid electrolyte and are bounded at least in some areas by a housing, the improvement comprising that the housing is subdivided into at least two housing elements of which one inner metallic housing element is provided for electrical conductance, is sealed vacuum-tight and is made of a highly conductive heat-resistant aluminum and an outer housing element made of a heat resistant material having a thickness between 0.3 and 0.5 cm for supporting the inner housing element, closely encloses the inner housing element and consists of a continuous tube open at both ends and two discs with one disc at each open end of the tube terminating the end faces of the cell in the housing, wherein by thermo-compression the inner housing element is directly connected to an insulating ring of the solid electrolyte and also the insulating ring is connected to the outer housing element via an aluminum enclosure and wherein a space between the inner housing element and the solid electrolyte is designed as a gap and serves as the anode space, a supply container for the alkali metal disposed in the lower portion of the inner housing element beneath the alkali-ion-conducting solid electrolyte, and lower lateral region openings in the supply container through which the alkali metal can leave the supply container and get into said gap, said supply container otherwise sealed on all sides.

4,576,882

POLYETHYLENE IMINE-METAL SALT SOLID ELECTROLYTE

George T. Davis; Chawan-Kang Chiang, both of Gaithersburg; Joseph M. Antonucci, Kensington, all of Md., and Toru Takahashi, Chiba, Japan, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1985, Ser. No. 706,811

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 8 Claims

1. A solid polymer electrolyte comprising:

(a) a matrix of linear poly(ethylene imine) having the formula $(-CH_2CH_2NH-)_n$; and

(b) a metal salt selected from the group consisting of LiI, $LiClO_4$, NaI, NaBr, KI, CsSCN, $AgNO_3$, $CuCl_2$, $CoCl_2$, and $Mg(ClO_4)_2$, wherein the salt is dissolved in and uniformly distributed throughout the poly(ethylene imine) matrix and from more than zero to 0.10 moles of salt are used per mole of monomer repeat unit, $-CH_2CH_2NH-$.

4,576,883

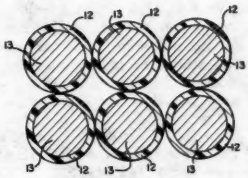
CATHODE COMPOSITION AND METHOD FOR SOLID STATE LITHIUM BATTERY

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed May 2, 1985, Ser. No. 729,643

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 5 Claims



1. In a solid-state lithium battery of the type comprising a lithium or lithium/aluminum anode, a polymeric electrolyte, and a cathode based on vanadium oxide, the improvement comprising:

a cathode comprising a multiplicity of spheres, each sphere consisting of a vanadium oxide core encapsulated in a polymer film, said polymer film containing an inorganic salt and an activated carbon.

4,576,884

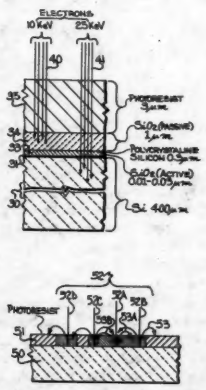
METHOD AND APPARATUS FOR EXPOSING PHOTORESIST BY USING AN ELECTRON BEAM AND CONTROLLING ITS VOLTAGE AND CHARGE

Arnold Reisman, Raleigh, N.C., assignor to Microelectronics Center of North Carolina, Research Triangle Park, N.C.

Filed Jun. 14, 1984, Ser. No. 620,510

Int. Cl.[4] G03C *5/00*; G21K *5/04*

U.S. Cl. 430—30 3 Claims



1. A method for exposing photoresist with an electron beam during the fabrication of a semiconductor device, said method comprising the steps of:

coating a substrate to an approximate predetermined thickness with a photoresist that is exposed in response to an incident electron beam;

locating any variations in the thickness of the coated photoresist in the area upon which the electron beam is incident;

projecting an electron beam onto the coated photoresist and deflecting the electron beam to trace a pattern on the photoresist; and

controlling the energy of the projected electron beam by controlling the acceleration voltage of the projected electron beam as it is deflected to correlate the acceleration voltage to local variations in the thickness of the coated photoresist to match the penetration depth of the electron beam into the photoresist to the thickness of the photoresist at each of the locations upon which the electron beam is incident, and controlling the amount of charge of the electron beam to maximize the energy of the electron beam absorbed by the coated photoresist and minimize the energy absorbed by structures underlying the substrate during exposure from the incident electron beam so that the coated photoresist is thoroughly exposed and ionizing radiation damage to the underlying substrate from the projected electron beam is minimized.

4,576,885
PHOTOGRAPHIC MATERIAL FOR THE SILVER DYE BLEACH PROCESS

Mario Fryberg, Praroman-le-Mouret; Heinrich Schaller, Fribourg; Rolf Steiger, Praroman, and Heinz Peter, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

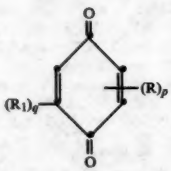
Filed Jan. 16, 1984, Ser. No. 571,018

Claims priority, application Switzerland, Jan. 26, 1983, 425/83

Int. Cl.[4] G03C 7/32

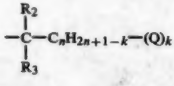
U.S. Cl. 430—390 **13 Claims**

1. A photographic silver dye bleach material which, in at least one layer, contains at least one compound of the formula



(1)

in which R is a radical of the formula



(2)

in which Q is $—CO_2R_4$, in which R_4 is alkyl having 1 to 20 carbon atoms, which is unsubstituted or is substituted by $—OR_6$, in which R_6 is cycloalkyl having 3 to 12 carbon atoms, alkenyl having 3 to 20 carbon atoms, aryl having 6 to 10 carbon atoms, which is unsubstituted or is monosubstituted or disubstituted by alkyl groups having 1 to 4 carbon atoms each, or aralkyl having 7 to 13 carbon atoms, and which may contain 1 to 5 oxygen atoms, or R_4 is alkenyl having 3 to 20 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, aryl having 6 to 10 carbon atoms, which is unsubstituted or is substituted by alkyl having 1 to 4 carbon atoms, or is aralkyl having 7 to 13 carbon atoms, a heterocyclic ring which contains an oxygen atom or a nitrogen atom and is unsubstituted or substituted by 1, 2, or 4 alkyl groups having 1 to 4 carbon atoms each, or is methyl substituted by a 5-membered or 6-membered heterocyclic ring which contains an oxygen atom and is unsubstituted or is monosubstituted or disubstituted by alkyl groups having 1 to 4 carbon atoms each, or Q is $—CONR_4R_5$, wherein R_4 is as defined above and R_5 is hydrogen or alkyl having 1 to 20 carbon atoms or R_4 and R_5, together with the nitrogen atom to which they are linked, form a 5-membered or 6-membered ring which is unsubstituted or is monosubstituted or disubstituted by alkyl groups having 1 to 4 carbon atoms each, with the proviso that R_5 is different from hydrogen if R_4 is alkyl or aryl, or Q is —OX, in which X is R_5 or $—COR_7$, in which R_5 is as defined and R_7 is alkyl having 1 to 20 carbon atoms, alkenyl having 3 to 20 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, aralkyl having 7 to 13 carbon atoms or aryl having 6 to 10 carbon atoms, which is unsubstituted or is monosubstituted or disubstituted by alkyl groups having 1 to 4 carbon atoms each, or Q is $—NR_8R_9$ in which R_8 is hydrogen or alkyl having 1 to 4 carbon atoms and R_9 is hydrogen, alkyl having 1 to 4 carbon atoms or $—COR_7$, in which R_7 is as defined above, or R_8 and R_9, together with the nitrogen atom to which they are linked, form a 5-membered or 6-membered ring which is unsubstituted or is monosubstituted or disubstituted by alkyl groups having 1 to 4 carbon atoms each, or Q is $—P(O)(OR_{10})-([O]_xR_{11})$, in which x is 0 or 1, and, if x=1, R_{10} and R_{11} independently of one another are hyrogen or alkyl having 1 to 20 carbon atoms, or R_{10} and R_{11} form an alkylene group having 2 to 3 carbon atoms, which is unsubstituted or is monosubstituted or polysubstituted by alkyl groups having 1 to 20 carbon atoms each, or, if x=0, R_{10} is hydrogen or alkyl having 1 to 20 carbon atoms and R_{11} is unbranched alkyl having 1 to 5 carbon atoms, or Q is $—SO_2R_{12}$, in which R_{12} is hydroxy, chlorine or NR_5R_7, in which R_5 and R_7 are as defined above, with the proviso that R_5 is different from hydrogen if R_7 is alkyl or aryl, R_1 being a radical of the formula (2) if R_{12} is hydroxy, or Q is cyano, R_2 and R_3 independently of one another are alkyl having 1 to 5 carbon atoms and, if $Q=CO_2R_4$, R_2 or R_3 may be substituted by $—CO_2R_4$, or R_2 and R_3 can, together with the radical of the formula $—C_nH_{2n+1-k}$, form a cycloalkyl radical having 5 to 12 carbon atoms, which is monosubstituted or disubstituted by groups of the formula $—CO_2R_4$, in which R_4 is as defined, R_1 is alkyl having 1 to 8 carbon atoms or a radical of the formula (2), p is 1 or 2, q is 0 or 1, p+q having to be 1 or 2, n is 1 to 20 and k is 1 or 2, or a salt of the compound of the formula (1).

4,576,886
AZO PHOTORECEPTOR

Naohiro Hirose; Osamu Sasaki, and Yoshio Takizawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

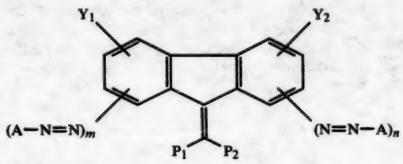
Filed Feb. 11, 1985, Ser. No. 700,531

Claims priority, application Japan, Feb. 13, 1984, 59-24658; Mar. 19, 1984, 59-53237; Mar. 27, 1984, 59-60418; Apr. 10, 1984, 59-72376; Apr. 10, 1984, 59-72377; Apr. 11, 1984, 59-73820

Int. Cl.[4] G03G 5/06, 5/14

U.S. Cl. 430—59 **20 Claims**

1. A photoreceptor comprising a support and a photosensitive layer which contains an azo compound of the formula [I]:

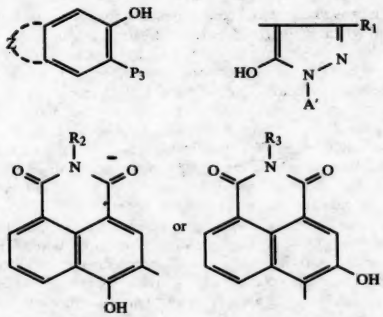


[I]

wherein P_1 and P_2 are independently a halogen atom, a hydrogen atom, an alkyl group, an alkoxy group, an aryl group, an acetylamido group, an alkylsulfonyl group,

(Q_1 is an alkyl group, an alkoxy group, a phenyl group, an amino group, a hydroxy group or a hydrogen atom) or

(Q_2, Q_3 and Q_4 independently are a halogen atom, a hydrogen atom, an alkyl group, an alkoxy group, a phenyl group, an acyl group, an ester group, a hydroxy group or a vinyl group), said alkyl group, alkoxy group, aryl group, amino group and vinyl group may have a substituent; Y_1 and Y_2 independently are a hydrogen atom, a halogen atom, a cyano group, a hydroxy group, an alkyl group or an alkoxy group; m and n each represent an integer of 0 to 2, and m and n cannot be both 0; A represents a group represented by any one of the following formulae:



wherein Z is a group of atoms necessary for constituting a substituted or unsubstituted aromatic carbon ring or an aromatic heterocyclic ring, P_3 is a substituted or unsubstituted carbamoyl group or a substituted or unsubstituted sulfamoyl group, R_1 is a hydrogen eatom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted amino group, a substituted or unsubstituted carbamoyl group, a carboxyl group and its ester group or a cyano group, A′ is a substituted or unsubstituted aryl group, R_2 and R_3 independently are a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group or a substituted or unsubstituted aryl group.

14. A photoreceptor according to any one of claims **1, 2, 4, 6, 8, 10** and **12**, wherein said photosensitive layer contains a carrier transporting material and said azo compound as a carrier generating material.

15. A photoreceptor according to claim **14**, wherein said photosensitive layer comprises a carrier transport layer with contains said carrier transporting material and a carrier generation layer which contains said carrier generating material.

4,576,887

PHOTOCONDUCTIVE POLYMER COMPOSITIONS

Paul Ehrlich, Eggertsville; Wayne A. Anderson, Hamburg, both of N.Y.; En T. Kang, Singapore, Taiwan, and Ansuya P. Bhatt, Salem, Mass., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,275
Int. Cl.⁴ G03G *5/07*
U.S. Cl. 430—71 **11 Claims**

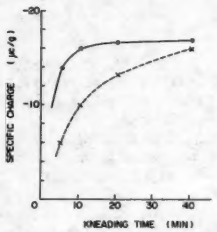
1. A photoconductive device comprising polyphenylacetylene as a photoconductive material thereof, at least 60 weight percent of said polyphenylacetylene being in the trans-configuration.

4,576,888

TONER FOR ELECTROPHOTOGRAPHY COMPRISING AZOIC PIGMENT HAVING SILICA CORE

Nobuhiro Miyakawa, Abiko; Kouji Maekawa, Kyoto; Teruaki Higashiguchi, Tokyo, and Kaname Nakatani, Kawasaki, all of Japan, assignors to Mita Industrial Company, Limited, Osaka, Japan

Filed Feb. 24, 1984, Ser. No. 583,425
Claims priority, application Japan, Feb. 28, 1983, 58-30950
Int. Cl.⁴ G03G *9/08*
U.S. Cl. 430—106 **14 Claims**



1. A toner for electrophotography, comprising an azoic pigment having a silica core as a coloring component, and a resin medium for fixation, said azoic pigment comprising a core of a fine powder of silica and a coating of a monoor polyazoic dye chemically bound to the surface of the silica core through an aminosilane coupling agent.

4,576,889

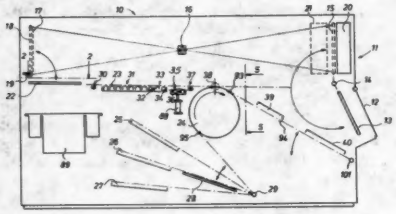
METHOD FOR TRANSFERRING XEROGRAPHIC IMAGES

Leo N. Vackier, 's-Gravenwezel; Jozef L. Mampaey, Kontich, and Leo B. Alaerts, Boechout, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 498,160, May 25, 1983, Pat. No. 4,492,177.
This application Sep. 6, 1984, Ser. No. 647,902
Claims priority, application Belgium, May 26, 1982, 8215318
Int. Cl.⁴ G03G *13/14, 9/08, 15/06, 15/14*
U.S. Cl. 430—126 **8 Claims**

1. Method for transferring a liquid xerographic toner image between the mutually facing surfaces of two elements, at least one of which is in generally flexible sheetlike form, which comprises advancing said flexible sheetlike element along a generally straight line path while supporting such element by its margins with the remainder thereof being unsupported and

capable of deflection from the general plane of said element as a whole; advancing the other element along an arcuate path around a fixed axis, said path having a locus thereof in close spaced proximity to the generally straight line path of said flexible element, while generally rigidly supporting said other element; determining the respective rates of advances of said elements to bring the same to the locus or proximity of the two paths substantially synchronously; depositing a liquid xerographic toner image on one of the mutually facing surfaces of said elements before such element reaches said locus of prox-



imity; while said flexible element passes through said locus of proximity applying a biasing force to its unsupported region to deflect that region out of the general plane of the sheet toward the other element to bring the toner image into direct contact with both element surfaces and thereby maintain the two element surfaces out of contact during their passage through said locus of proximity; and generating an electrical potential gradient across the two elements while they are passing through said locus of proximity with the toner image sandwiched therebetween to cause said toner image to transfer from the surface on which it is deposited to the other surface.

4,576,890
PREPARATION OF ENCAPSULATED ELECTROSTATOGRAPHIC TONER MATERIAL

Noriyuki Hosoi, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1984, Ser. No. 589,535
Claims priority, application Japan, Mar. 14, 1983, 58-41960
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—137 **10 Claims**

1. A process for the preparation of an encapsulated electrostatographic toner material comprising a stage of forming shells around micro-droplets of hydrophobic core material containing colorant dispersed in an aqueous medium to produce microcapsules therein, and a stage of separating the microcapsules from the aqueous medium,

which is characterized in that methylcellulose is employed for stabilizing the micro-droplets of core material in the aqueous medium.

4,576,891
PHOTOSENSITIVE MICROCAPSULES USEFUL IN POLYCHROMATIC IMAGING HAVING RADIATION ABSORBER

Paul C. Adair, and Amy L. Burkholder, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

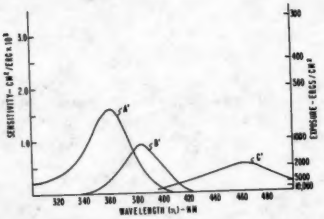
Filed Jun. 15, 1984, Ser. No. 620,994
Int. Cl.[4] S03C *1/00;* **B01J** *13/02*
U.S. Cl. 430—138 **12 Claims**

1. A photosensitive material comprising a support having a layer of photosensitive microcapsules on the surface thereof,

said photosensitive microcapsules including first and second photosensitive microcapsules having first and second color formers associated therewith and having internal phases which respectively contain first and second photosensitive compositions which harden upon exposure to actinic radiation;

actinic radiation hardening said first photosensitive composition constituting a first spectral sensitivity range and actinic radiation hardening said second photosensitive composition constituting a second spectral sensitivity range;

said first and second spectral sensitivity ranges being different but overlapping in part;



said first photosensitive microcapsule additionally having associated therewith a compound which absorbs actinic radiation in the overlapping portion of said spectral sensitivity ranges such that the sensitivity of said first photosensitive microcapsule to actinic radiation in the overlapping portion of said spectral sensitivity ranges is reduced.

4,576,892
PHOTOSENSITIVE MATERIALS

Eugene Golda, Monsey, and Alan Wilkes, Brewster, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 510,456, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 388,046, Jun. 14, 1983, abandoned, which is a continuation of Ser. No. 173,229, Jul. 28, 1980, abandoned. This application Mar. 12, 1985, Ser. No. 710,827
Int. Cl.[4] G03F *7/08;* **G03C** *5/18*
U.S. Cl. 430—157 **15 Claims**

1. In a presensitized plate, for use in lithography, having a support member with a metal surface and an overlying layer on said metal surface, said layer comprises a photosensitive composition further comprising a diazo compound relative to light, the improvement which comprises employing a diazo compound which has been subjected to treatment prior to preparation of the photosensitive composition, prior to being coated on said metal surface, and prior to imagewise exposure for a time period sufficient to accelerate its light reactivity characteristics thereby improving its relative exposure sensitivity, said treated diazo compound having an absorbance at 375 nm of 0.40–0.79 and at 650 nm of 0.90–2.0, and wherein said treatment comprises (a) heating said diazo compound to a temperature above about 35° C. up to about 120° C., (b) ultraviolet light, (c) laser beam, or (d) electron beam.

11. In a process for preparing a presensitized plate, for use in lithography, by applying to a support member with a metal surface an overlying coating of a photosensitive composition comprising a diazo compound reactive to light to define printing and non-printing area, the improvement which comprises subjecting the diazo compound to treatment prior to preparation of the photosensitive composition, prior to being coated on said metal surface, and prior to imagewise exposure to accelerate its reactivity in the presence of light thereby improving its relative exposure sensitivity, said treated diazo compound having an absorbance at 375 nm of 0.40–0.79 and at 650 nm of 0.90–2.0, and wherein said treatment comprising (a) heating said diazo compound to a temperature above about 35° C. up to about 120° C., (b) ultraviolet light, (c) laser beam, or (d) electron beam.

15. A method of accelerating the reactivity of a photosensitive diazo compound and improving its relative exposure sensitivity to light which comprises heating said diazo compound to a temperature of from above about 35° C. to about 120° C., for about 1 to about 150 hours prior to exposing said diazo compoud to light, prior to formulating a photosensitive composi-

tion with said diazo compound, and prior to coating said diazo compound on a metal substrate, said heating diazo compound having an absorbance at 375 nm of 0.40–0.79 and at 650 nm of 0.90–2.0.

4,576,893

PRESENSITIZED LITHOGRAPHIC PRINTING PLATE PRECURSOR

Eiji Nakakita; Akinobu Koike; Toshiyuki Sekiya; Hiroshi Misu, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1984, Ser. No. 622,597

Claims priority, application Japan, Jun. 21, 1983, 58-111672

Int. Cl.⁴ G03C *1/60*; G03F *7/08*

U.S. Cl. 430—457 **10 Claims**

1. A presensitized lithographic printing plate precursor comprising an aluminum support that has been rendered hydrophilic and has provided thereon, a light-sensitive layer composed of a light-sensitive composition comprising in admixture (1) an organic solvent-soluble snd substantially water-insoluble light-sensitive diazo resin, (2) a substantially water-insoluble, film-forming organic polymeric compound, and (3) at least one of a substituted or unsubstituted pyridine-2,6-dicarboxylic acid, wherein said diazo resin is present in an amount of from about 3 to about 30% by weight, based on the total weight of the diazo resin (1) and the substantially water-insoluble, film forming organic polymeric compound (2), and wherein said substituted or unsubstituted pyridine-2,6-dicarboxylic acid is present in an amount of from about 1 to about 100% by weight based on the weight of the diazo resin.

4,576,894

TANNING DEVELOPMENT IN LOW SILVER PHOTOIMAGING USING POLYMERIC COUPLERS

Dennis S. Donald, Mendenhall, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Sep. 24, 1984, Ser. No. 653,593

Int. Cl.⁴ G03C *1/30, 1/06, 5/36, 5/26*

U.S. Cl. 430—264 **25 Claims**

1. A photoimaging system comprising the components:

(i) a photosensitive element for photoimaging applications comprising a substrate coated with a photosensitive layer containing dispersed silver halide particles in operative association with a continuous film-forming phase of polymer coupler, the coupler characterized by a number average molecular weight of about 2,000 to 100,000, a content of about 10 to 100 milliequivalents of coupler groups per 100 g of polymeric coupler and about 15 to 175 milliequivalents per 100 g of polymeric coupler of at least one acid group selected from carboxylic, sulfonic, and phosphonic, and the ability to couple with an oxidized developer of component (ii) to become insoluble in aqueous media; and

(ii) a developer consisting essentially of catechol, pyrogallol, or a hydroquinone or N-substituted aminophenol-type developing agent having at least two active coupling sites;

the system characterized further in that components (i) and (ii) cooperate to provide photoimages that are substantially colorless.

4,576,895

OPTICAL RECORDING BY ENERGY-INDUCED FRACTIONATION AND HOMOGENIZATION

Roger W. Barton, Los Altos; Hans J. Coufal, San Jose; Victor B. Jipson, San Jose, and Wen Y. Lee, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,410

Int. Cl.⁴ G03C *1/94*

U.S. Cl. 430—270 **13 Claims**

1. A method of information recording comprising the steps of

providing a film of a mixture on a substrate, said mixture comprising a matrix material and an incident energy absorbing material which fractionates and/or homogenizes under treatment with sufficient energy, said mixture having a physical state after fractionation and/or homogenization which will undergo further physical state transformation only under treatment with additional energy,

treating a spot on said film with sufficient energy to effect fractionation and/or homogenization of the film without ablation resulting in homogeneous and inhomogeneous regions whereby the physical changes caused by the fractionation and/or homogenization on said treated spot can be detected by the resulting changes in its physical properties,

said matrix material being SiO_2, TeO_2, GeO_2, MoO_2, Sb_2O_3, Bi_2O_3, In_2O_3, TbO, $(CF_4)_n$, Se or a mixture thereof, and

said energy absorbing material being Au, Ag, Pt, Pd, Ti, Cr, Cu, Te, Ge, Mn, Sb, Bi, Sn, In, Pb or a mixture thereof.

4,576,896

OPTICAL RECORDING MEDIUM

Setsuo Suzuki; Morio Tsuge, and Syoichi Nakayama, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,946

Claims priority, application Japan, Dec. 6, 1983, 58-229196

Int. Cl.⁴ G11B *3/70*

U.S. Cl. 430—271 **14 Claims**

1. An optical recording medium comprising a transparent substrate of a synthetic resin and an information recording layer provided thereon, on which medium information can be optically written, read and erased by means of a laser light, said transparent substrate consisting essentially of a cast-cured product of an epoxy resin composition comprising an alicyclic epoxy resin, an organic polybasic acid anhydride, a curing-accelerator and an anti-discoloring agent.

4,576,897

PROCESS OF MAKING A POLYAMIDE PRINTING PLATE HAVING AN IMPROVED CONTACT WITH AN IMAGE-BEARING FILM

Junichi Fujikawa, Kyoto; Osamu Togashi, Ohtsu, and Shigetra Kashio, Shiga, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Continuation of Ser. No. 545,113, Oct. 25, 1983, abandoned, which is a continuation of Ser. No. 288,324, Jul. 30, 1981, abandoned. This application Dec. 21, 1984, Ser. No. 684,972

Claims priority, application Japan, Aug. 7, 1980, 55-108630

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—273 **6 Claims**

1. A process of preparing a polyamide printing plate having an improved contact with an image-bearing film, which comprises providing a base layer, applying thereto a photosensitive polyamide layer comprising alcohol-soluble or water-soluble polyamide and ethylenically unsaturated compound, applying an anti-stickiness layer comprising a polymer which is soluble or dispersible in a developer for said photosensitive polyamide, said anti-stickiness layer having a thickness in the range of from 0.2 to 20μ and having a matted surface which is formed by applying a polymer for the anti-stickiness layer in advance onto the mat surface of a matted film to form a coating and then bringing it into pressure contact with the photosensitive layer thereby transferring the anti-stickness coating onto the photosensitive layer, and then removing the matted film from the antistickiness coating which has been transferred to the photosensitive layer.

4,576,898

PROCESS OF MAKING PHOTOPOLYMER RELIEF PLATES USING AN ADHESIVE LAYER

Gerhard Hoffmann, Otterstadt; Dieter Kleuser, Frankenthal, and Werner Lenz, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

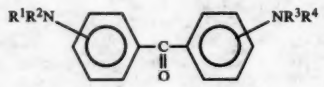
Division of Ser. No. 465,996, Feb. 11, 1983, abandoned, which is a continuation of Ser. No. 310,403, Oct. 9, 1981, abandoned. This application Oct. 9, 1984, Ser. No. 658,463

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039209

Int. Cl.[4] G03C 7/02

U.S. Cl. 430—306 9 Claims

1. A process for the production of photopolymer relief plates which comprises applying a photosensitive relief-forming layer R of a mixture comprising a photopolymerizable ethylenically unsaturated compound and a photoinitiator to a dimensionally stable base which bears an adhesive layer A for the layer R, exposing the layer R imagewise to actinic light of a wavelength range of from 300 to 400 nm and subsequently removing the unexposed areas of the layer, wherein a layer R, containing from 0.0001 to 3 percent by weight of a thermal polymerization inhibitor which on ultraviolet irradiation liberates nitrosyl free radicals is applied to an adhesive layer A, which contains from 0.01 to 10 percent by weight of a compound



where R^1, R^2, R^3 and R^4 are identical or different and each is alkyl or R^5—(O-alkylene)$_x$—, R^5 being H or alkyl and x being 1, 2, 3, 4 or 5.

4,576,899

METHOD FOR ENHANCING APPARENT PHOTOSPEED OF DIAZONIUM PLATES BY USING THIOCYANATE TO INSOLUBILIZE DIAZONIUM COMPOUND AFTER PHOTOLYSIS

Luigi Amariti, Bloomingdale, and Llandro C. Santos, Chicago, both of Ill., assignors to Imperial Metal & Chemical Company, Philadelphia, Pa.

Filed May 1, 1984, Ser. No. 605,796

Int. Cl.[4] G03F 7/08

U.S. Cl. 430—309 5 Claims

1. A method for enhancing the apparent photospeed of a plate having a layer including a diazonium material, comprising:

selectively photolyzing a plate to define image areas, said plate having a layer including a light-sensitive, negative-working diazonium material, said selective photolyzing including underexposing the diazonium material at the image areas, said underexposing including removing some, but not all, diazonium groups from the diazonium material;

applying a developer composition to the selectively photolyzed and underexposed plate, wherein said developer composition includes substantial amounts of water and an insolubilizing reactant, said insolubilizing reactant being a thiocyanate salt that is present in an amount sufficient to enhance the apparent photospeed of the plate;

reacting the insolubilizing reactant of the applied developer composition with unphotolyzed diazonium groups of the diazonium material at the image areas in order to reduce the solubility of the selectively photolyzed diazonium material; and

removing unphotolyzed diazonium material from the plate while substantially retaining the photolyzed and reacted diazonium material on the plate at the image areas, wherein said unphotolyzed diazonium material is soluble in the developer composition and said photolyzed and reacted diazonium material at the image areas is insoluble in the developer composition.

4,576,900

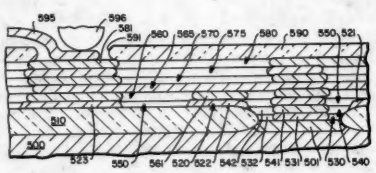
INTEGRATED CIRCUIT MULTILEVEL INTERCONNECT SYSTEM AND METHOD

Ping-Wang Chiang, Los Gatos, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 310,089, Oct. 9, 1981, abandoned. This application Sep. 11, 1984, Ser. No. 649,531

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—313 17 Claims



1. A process for forming an integrated circuit on a substructure having a substantially varying surface topology with surface hills and valleys including the step of forming a plural layer, conductor interconnect pattern and including the step of forming a plurality of successive, substantially planar, composite layers of insulating material and conductive material in said valleys with said insulating material on each layer defining a pattern of regions filled with conductive material to serve as part of a vertical and horizontal interconnect system, the steps for forming each composite layer comprising:

(a) forming a pattern of regions of conductive material on said substructure, said regions of conductive material having an upper surface;

(b) forming over said pattern of conductive regions a layer of first insulating material to a thickness substantially greater than the thickness of said conductive material and having a substantially planar top surface; and

(c) etching back said top surface of said layer of first insulating material down to the top surface of said regions of conductive material.

4. The process of claim 1, wherein said step of forming said pattern of regions of conductive material comprises forming a continuous layer of conductive material on said substrate and patterning said layer of conductive material using photolithography and selective etching steps.

4,576,901

PROCESS FOR PRODUCING NEGATIVE COPIES BY MEANS OF A MATERIAL BASED ON 1,2-QUINONE DIAZIDES WITH 4-ESTER OR AMIDE SUBSTITUTION

Paul Stahlhofen, and Gerhard Mack, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,759

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 3325023

Int. Cl.[4] G03F 7/26, 7/08

U.S. Cl. 430—325 11 Claims

1. A process for producing negative relief copies, comprising the steps of:

(a) imagewise exposing a light-sensitive material to light through an original, said material comprising a light-sensitive layer which consists essentially of (1) a binder that is insoluble in water and soluble in aqueous-alkaline solutions and (2) an amount of a 1,2-quinone diazide sufficient to render said layer light-sensitive, said diazide comprising at least one of an ester and an amide of one selected from

the group consisting of a 1,2-benzoquinone-2-diazide-4-sulfonic acid, a 1,2-benzoquinone-2-diazide-4-carboxylic acid, a 1,2-naphthoquinone-2-diazide-4-sulfonic acid, and a 1,2-naphthoquinone-2-diazide-4-diazide-4-carboxylic acid, such that said diazide undergoes photodecomposition; thereafter

(b) heating said material, such that cross-linking is effected in portions of said light-sensitive layer exposed to said light;

(c) after (b), cooling and then exposing said material again without said original, such that portions of said light-sensitive layer not exposed during step (a) are rendered alkali-soluble; and then

(d) developing said material with an aqueous-alkaline developer, such that said portions of said layer rendered alkali-soluble are solubilized.

10. A process for producing negative relief copies, comprising the steps of:

(a) imagewise exposing a light-sensitive material to light through an original, said material comprising a light-sensitive layer which consists of (1) a binder that is insoluble in water and soluble in aqueous-alkaline solutions and (2) an amount of a 1,2-quinone diazide sufficient to render said layer light-sensitive, said diazide comprising at least one of an ester and an amide of one selected from the group consisting of a 1,2-benzoquinone-2-diazide-4-sulfonic acid, a 1,2-benzoquinone-2-diazide-4-carboxylic acid, a 1,2-naphthoquinone-2-diazide-4-sulfonic acid, and a 1,2-naphthoquinone-2-diazide-4-diazide-4-carboxylic acid, such that said diazide undergoes photodecomposition; thereafter

(b) heating said material, such that cross-linking is effected in portions of said light-sensitive layer exposed to said light;

(c) after (b), cooling and then exposing said material again without said original, such that portions of said light-sensitive layer not exposed during step (a) are rendered alkali-soluble; and then

(d) developing said material with an aqueous-alkaline developer, such that said portions of said layer rendered alkali-soluble are solubilized.

4,576,902

PROCESS OF MAKING AND USING A POSITIVE WORKING PHOTOSENSITIVE FILM RESIST MATERIAL

Dietrich Saenger, 16 A Lorcher Ring, 6710 Frankenthal, and Helmut Barzynski, 49 An der Ameisenhalde, 6702 Bad Durkheim 1, both of Fed. Rep. of Germany

Division of Ser. No. 522,267, Aug. 11, 1983, which is a continuation of Ser. No. 415,455, Sep. 7, 1982, abandoned, which is a continuation of Ser. No. 283,910, Jul. 7, 1981, abandoned, which is a continuation of Ser. No. 154,895, May 30, 1980, abandoned. This application Dec. 4, 1984, Ser. No. 678,050

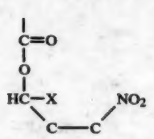
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922746

Int. Cl.[4] **G03C** *5/00*

U.S. Cl. 430—326 **7 Claims**

1. A process for producing a resist pattern on a substrate which comprises:

laminating to a permanent support a positive working photosensitive dry film resist wherein the photosensitive material of the resist consists essentially of a polymer which has a mean molecular weight greater than 500, contains, chemically bonded in the molecule, not less than 5% by weight, based on the polymer molecular weight, of aromatic or hetero-aromatic o-nitrocarbinol ester groups of the formula I



(I)

A

where A is an aromatic or hetero-aromatic, unsubstituted or substituted ring system with from 5 to 14 ring members and X is hydrogen, alkyl of 1 to 8 carbon atoms or unsubstituted or substituted aryl or aralkyl, and can, after exposure, be washed out with an alkaline solvent or solvent mixture, and a plasticizing compound which is compatible with the polymer and is transparent in the wavelength range of from 300 to 400 nm, this compound being present in such an amount that the optical density of the film at a wavelength of 360 nm is from 0.05 to 3 and that the film softens sufficiently, on lamination at a conventional processing temperature of above 40° C., that it can be laminated to the permanent support;

exposing the laminated resist film image-wise to ultraviolet light; and

washing out the exposed areas of the resist with an alkaline developer.

4,576,903

DEVELOPER FOR POSITIVE PHOTORESISTS

Winfried Baron, Rossdorf; Kurt Marquard, Reinheim; Hans-Joachim Merrem, Seeheim; Raimund Sindlinger, Ober-Ramstadt, and Klaus-Peter Thiel, Brensbach-Wersau, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 685,085

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346979

Int. Cl.[4] **G03C** *5/00;* **G03F** *7/00*

U.S. Cl. 430—331 **11 Claims**

1. In a developer for positive photoresists of the phenol/formaldehyde-novolak type containing an o-diazoquinone-type compound as a light-sensitive component,

consisting essentially of effective amounts of,

water,

an inorganic alkali metal compound producing hydroxyl ions in water,

a buffer maintaining a pH of about 12–14,

and a non-ionic surfactant,

the improvement wherein the amount of non-ionic surfactant is about 1–100 ppm,

whereby said developer is effective to develop said positive photoresist with high resolution.

4,576,904

METHOD FOR DEVELOPING NATURAL CAMOUFLAGE PATTERNS

George Anitole, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 527,532, Aug. 29, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 749,854

Int. Cl.[4] **G03C** *5/00*

U.S. Cl. 430—347 **12 Claims**

1. A method for more scientifically generating more natural camouflage patterns, comprising the steps of:

(a) selecting for photographing a natural environmental background area site, of the type in which military equipment and personnel are expected to operate;

(b) providing means for establishing a known lateral distance

scale so that it will appear in conjunction with a resulting negative or positive film across the area photographed;

(c) photographing the selected area background and processing to obtain at least a first positive image photograph of the background area which photograph embodies all contrast tonal levels of the area;

(d) examining and evaluating said photograph to determine the potential acceptability of the various contrast tonal levels thereof in its initial form against a potential need to prepare any subsequent generation photographs to achieve bolder higher contrast tonal levels while eliminating certain lesser contrast tonal areas;

(e) selecting an area of said at least first positive image photograph's higher contrast pattern to be representative of an average blend of the predominately dark and light tonal areas to constitute the basic camouflage pattern, and enlarging this selected area pattern to a scaled up size into a form which will be compatibly adaptable for subsequent transfer onto the aforesaid military equipment;

(f) transposing at least in outline form the selected higher contrast dark and light tonal areas of the selected pattern onto various equipment/materiel; and thereafter

(g) applying at least two different color paints to said selected higher contrast dark and light areas which paint colors are deemed to provide the best camouflage effect as determined by a comparative evaluation with at least said initial photograph of said background environmental area site.

4,576,905

PHOTOGRAPHICALLY USEFUL CHALCOGENAZOLES, CHALCOGENAZOLINES, AND CHALCOGENAZOLINIUM AND CHALCOGENAZOLIUM SALTS

Wolfgang H. H. Gunther, Webster; Ronald E. Leone, and Rosemary Przyklek, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 529,829, Sep. 6, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 660,155

Int. Cl.[4] G03C *1/34, 1/28, 1/02, 5/24*

U.S. Cl. 430—401 **122 Claims**

1. A radiation sensitive silver halide emulsion comprised of a dispersing medium,

radiation sensitive silver halide grains, and

a photographically useful concentration of an addendum containing an aromatic ring and, fused with said aromatic ring, a five membered ring containing a divalent tellurium atom, a nitrogen atom, and a carbon atom interposed between said tellurium and nitrogen atoms.

4,576,906

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT WITH HEAT TREATED PYRAZOLIDINONE DEVELOPER

Osamu Takahashi, and Minoru Sakai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 631,418, Jul. 16, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,093

Claims priority, application Japan, Jul. 14, 1983, 58-128226

Int. Cl.[4] G03C *5/54, 1/40, 1/42, 5/30*

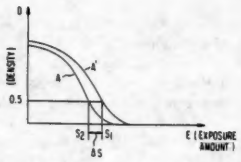
U.S. Cl. 430—497 **18 Claims**

1. A color diffusion transfer photographic element which comprises a support having provided thereon at least one silver halide emulsion layer containing a non-diffusible redox compound capable of releasing a diffusible dye or a precursor thereof by processing with an alkaline processing solution in the presence of a silver halide developing agent after exposure to light, wherein

(a) said alkaline processing solution contains a 3-pyrazolidinone type developing agent,

(b) said alkaine processing solution is contained in a container destructible by pressure,

(c) said destructible container is assembled into the photographic element in such a position that the processing solution released from said container diffuses into the photographic layers, but said position does not interrupt exposure of the silver halide emulsion layer, and



(d) said alkaline processing solution is subjected to a heat treatment under a substantially oxygen-free condition for at least T days, wherein T is represented by the formula

$$\log T = \left(\frac{50 - X}{10}\right) \log 5 \qquad \text{(I)}$$

wherein X represents the maximum temperature, provided that X is about 40° C. or more and wherein said alkaline processing solution is heat treated before being assembled into the photographic element.

4,576,907

COLOR-PHOTOGRAPHIC RECORDING MATERIAL

Helmut Kampfer, Cologne; Hans Langen, Bonn, and Erwin Ranz, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,275

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332688

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—507 **10 Claims**

1. A colour-photographic recording material which has at least one photosensitive silver halide emulsion layer, at least one layer which contains colloidal silver and at least one silver-free layer positioned between these layers, at least one anti-foggant contained in said silver-free layer and said anti-foggant corresponding to the following formula:

$$(MS—Het—(Ar)_m—NR^1—CO)_nR^2$$

wherein

R^1 represents hydrogen or an optionally substituted aliphatic radical having from 1 to 6 carbon atoms,

R^2 represents an n-valent, optionally substituted aliphatic radical having from 4 to 17 carbon atoms when n represents 1, and having from 2 to 17 carbon atoms when n represents 2,

m represents 0 or 1,

n represents 1 or 2,

M represents hydrogen, an alkali metal atom or an ammonium group,

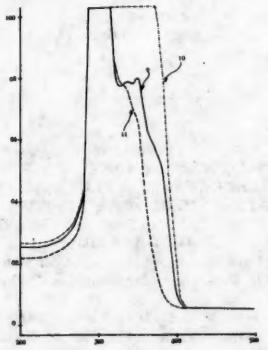
Ar represents a bivalent optionally substituted aromatic radical,

Het represents a bivalent heterocyclic radical containing at least one N-atom and which may be substituted.

4,576,908
ULTRAVIOLET ABSORBER IN PHOTOGRAPHIC ELEMENTS

Angelo Vallarino, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 8, 1984, Ser. No. 618,905
Claims priority, application Italy, Jun. 7, 1983, 65211 A/83
Int. Cl.[4] G03C 1/84
U.S. Cl. 430—512 7 Claims



1. A photographic element comprising a support base, at least one silver halide emulsion layer and at least one auxiliary layer over said silver halide emulsion layer, said photographic element being characterized by having at least one of said layers containing a dispersion of an ultraviolet radiation absorbing amount of 3-diallylaminoallylidenemalononitrile therein.

4,576,909
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Sohei Goto, and Ken Okauchi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,686
Claims priority, application Japan, Oct. 5, 1983, 58-187513
Int. Cl.[4] G03C 7/32
U.S. Cl. 430—546 15 Claims

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer wherein said layer contains a polymer coupler and a compound having the following general formula:

$$Ar—O—RO)_pH \qquad [I]$$

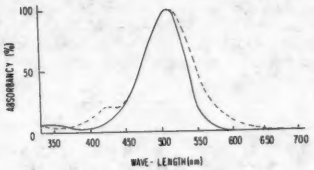
wherein Ar is an aryl group, R is an alkylene group, and p is an integer from 1 to 3.

4,576,910
SILVER HALIDE COLOR LIGHT-SENSITIVE MATERIAL CONTAINING MAGENTA COLOR IMAGE-FORMING POLYMER OR COPOLYMER COUPLER LATEX

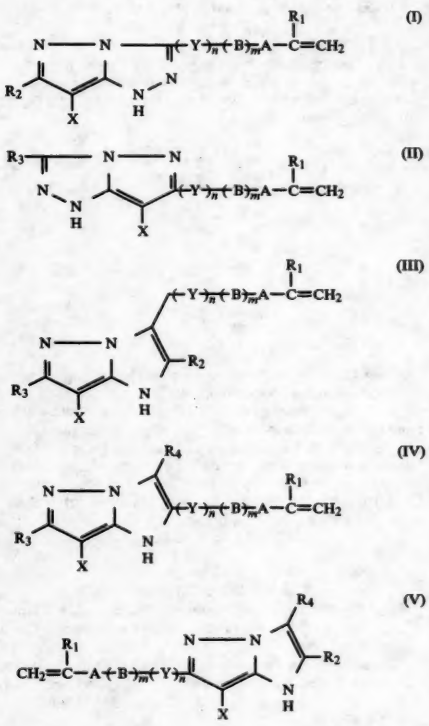
Tsumoru Hirano, and Nobuo Furutachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 11, 1984, Ser. No. 619,422
Claims priority, application Japan, Jun. 9, 1983, 58-103336; Aug. 8, 1983, 58-145331
Int. Cl.[4] G03C 1/08, 7/16, 7/26, 7/32
U.S. Cl. 430—548 18 Claims

1. A silver halide color photographic light-sensitive material containing in its silver halide emulsion layer a magenta color image-forming polymer or copolymer coupler capable of coupling with an oxidation product of an aromatic primary amine developing agent, wherein said coupler has repeating units



derived from the monomer represented by formula (I), (II), (III), (IV) or (V)



wherein R_1 represents a hydrogen atom, a lower alkyl group containing 1 to 4 carbon atoms or a chlorine atom, R_2, R_3 and R_4 each represents a hydrogen atom, a hydroxy group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted 5- or 6-membered hetero ring group, a substituted or unsubstituted alkylamino group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted anilino group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted alkylcarbonyl group, a substituted or unsubstituted arylcarbonyl group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted sulfamoyl group of a substituted or unsubstituted sulfonamido group, X represents a hydrogen atom, a halogen atom, or a

coupling-off group linked through an oxygen atom, nitrogen atom or sulfur atom, A represents —NHCO—, —OCO— or a phenylene group, B represents a substituted or unsubstituted alkylene (straight or branched), substituted or unsubstituted aralkylene or a substituted or unsubstituted phenylene group, Y represents —O—, —NH—, —S—, —SO—, —SO_2—, —CONH—, —COO—, —NHCO— or —NHCONH—, and m represents 1 when n represents 1, or m represents 0 or 1 when n represents 0.

4,576,911

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noboru Mizukura; Noboru Fujimori; Kosaku Masuda; Shinji Yoshimoto; Noriki Tachibana, and Eiichi Ueda, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,960

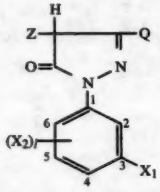
Claims priority, application Japan, Sep. 5, 1983, 58-163731

Int. Cl.[4] G03C *7/38*

U.S. Cl. 430—548 **16 Claims**

1. A silver halide color photographic light-sensitive material which comprises a silver halide emulsion layer containing a magenta dye formable polymer coupler comprising a repeating unit having the formula:

Formula [I]



wherein Q is an ethylenically unsaturated group or a group having an ethylenically unsaturated group; X_1 is a halogen atom; X_2 is a halogen atom that is bonded to a position selected from the second, fourth and fifth positions of the phenyl group; Z is a hydrogen atom or a radical that can be split off by the coupling reaction with the oxidized product of a color developing agent; and l is an integer of from 1 to 3, provided if the l is not less than 2, said X_2s are allowed to be either the same as or different from one another.

4,576,912

FLUOROIMMUNOASSAYING

Sidney Yaverbaum, East Windsor, N.J., and Jacob Kusnetz, New City, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 965,118, Nov. 30, 1978, abandoned. This application Feb. 28, 1983, Ser. No. 470,516

Int. Cl.[4] G01N *53/00, 33/553, 33/544, 33/542*

U.S. Cl. 435—7 **14 Claims**

1. A method of enhancing the fluorescent level of a fluoroimmunoassay, comprising the steps of:

(a) tagging a long-chain carrier selected from proteins, cellulose, cellulose derivatives, polymers or polysaacharides, said carrier having fluorophore binding sites and capable of treatment to release fluorophores bound thereto, with a plurality of fluorophores, said fluorophores selected from the group consisting of fluorescein, dansyl, rhodamine, fluorescamine, pyrene, acradine, 2-methoxy-2,4-diphenyl-3(2H)-furanone, and fluorescein mercuric acetate until a critical spacing distance of less than 100 Å is reached between said fluorophores to induce self-quenching therebetween;

(b) conjugating one reactant of said fluoro-immunoassay with said fluorescently-quenched carrier;

(c) reacting said conjugated reactant in a known amount with a competing immunoreactant sample and a known amount of a complementary-reactant-containing solid phase binding agent to form a mixture of bound and unbound reaction products, said solid phase binding agent selected from magnetic particulate cellulose, glass, latexes, plastics, agaroses, sepharoses and sephadexes;

(d) separating said bound and unbound reaction products;

(e) liberating the fluorophores from said carrier following said separation in either one of the bound or unbound reaction product by breaking up the carrier molecule by a lysing or chemical treatment; and

(f) measuring the enhanced fluorescent level of said liberated fluorophores.

4,576,913

NAD(P)-INDEPENDENT GLYCEROL DEHYDROGENASE, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF FOR THE DETERMINATION OF GLYCEROL AND TRIGLYCERIDES

Osao Adachi, and Minoru Ameyama, both of Yamaguchi, Japan, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,708

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311027

Int. Cl.[4] C12Q *1/00, 1/32;* **C12N** *9/04;* **C12R** *1/01, 1/02*

U.S. Cl. 435—26 **11 Claims**

1. Glycerol dehydrogenase which catalyzes the reaction of glycerol to dihydroxyacetone characterized in that said glycerol dehydrogenase is NAD(P)-independent.

2. Process for obtaining an NAD(P)-independent glycerol dehydrogenase comprising culturing, in a nutrient medium, a micro-organism of the species Pseudomonas, Serratia, Klebsiella, Erwinia, Aspergillus, Penicillium, Rhizopus, Acetobacter or Gluconobacter which is capable of forming this enzyme and isolating enzyme from the culture broth.

5. Process for the determination of glycerol, comprising converting glycerol into dihydroxyacetone with an NAD(P)-independent glycerol dehydrogenase according to claim 1 in the presence of a proton and electron acceptor, and measuring the decrease of the oxidised acceptor or the increase of the reduced acceptor or the increase of dihydroxyacetone as a measure of the glycerol.

4,576,914

METHOD FOR ENHANCING A FUNGUS-LYTIC ACTIVITY OF β-1,3-D-GLUCANASE

Akiyoshi Yoshida, Nara; Shigeru Kametaka, and Shin'ichi Hayashi, both of Osaka, all of Japan, assignors to Rohto Pharmaceutical Co., Ltd., Japan

Filed Oct. 17, 1983, Ser. No. 542,861

Claims priority, application Japan, Oct. 18, 1982, 57-183421

Int. Cl.[4] C12P *39/00;* **C12N** *9/24, 1/06;* **C12R** *1/06, 1/125, 1/645, 1/685, 1/885*

U.S. Cl. 435—42 **8 Claims**

1. A method of enhancing a fungus-lytic activity of β-1,3-D-glucanase which comprises using two β-1,3-D-glucanases of different origins.

2. A method of enhancing a fungus-lytic activity of β-1,3-D-glucanase which comprises using said glucanase in the presence of one or more of the activators selected from the group consisting of sodium lauroylsarcosinate, polyoxyethylene alkylphenyl ether, polyoxyethylene alkyl ether, polyoxyethylene polyoxypropylenealkyl ether, benzalkonium chloride, ammonium chloride, chlorhexidine glucuronate, methylparaben and propylparaben.

4,576,915

STRAINS OF *RHIZOBIUM PHASEOLI* AND PREPARATION OF CYCLIC (1→2)-β-D-GLUCAN

Tokuya Harada; Tadashi Higashiura, and Misae Okubo, all of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 14, 1983, Ser. No. 542,217
Claims priority, application Japan, Oct. 14, 1982, 57-180949
Int. Cl.[4] C12P *19/04;* C12R *1/41*
U.S. Cl. 435—101 13 Claims

1. A novel strain of *Rhizobium phaseoli* which produces cyclic β-1,2-glucon, but does not produce acidic extracellular polysaccharides or constituents of said acidic extracellular polysaccharides.

4,576,916

ELECTRO-OPTICAL APPARATUS FOR MICROBIAL IDENTIFICATION AND ENUMERATION

George E. Lowke, Hurst, Tex., and Robert J. Meltzer, Long Valley, N.J., assignors to Akzo N.V., Arnhem, Netherlands

Division of Ser. No. 371,906, Apr. 26, 1982, Pat. No. 4,467,032.
This application Jul. 11, 1984, Ser. No. 629,641
Int. Cl.[4] C12M *1/36;* C12Q *1/18, 1/04, 1/06*
U.S. Cl. 435—289 13 Claims

1. An apparatus for identifying and enumerating microbial cells comprising:

A. an electrical cell comprising,

i. a chamber having an inlet and an outlet,

ii. at least two walls disposed in parallel, spaced apart relation to each other, and

iii. paired electrodes located adjacent each of said walls and spaced apart from each other, said electrodes adapted to receive electrical current and to establish an induced electrical field across at least a portion of said chamber, and to promote the electrical alignment of microbial cells placed therein;

B. an optical sensing assembly comprising,

i. a laser light source positioned to pass a beam of laser light through said electrical cell and between said electrodes, and

ii. a laser light detector positioned in alignment with said light source to receive the laser light emerging from said electrical cell;

C. automated microbial sample delivery means in fluid registry with said electrical cell, to sequentially convey said microbial samples to said inlet; and

D. electrical signal processing means connected with said laser light detector, to translate the variations in birefringence caused by each microbial sample, into an electrical signal of quantitative data, for analysis and comparison with the results of previously performed control testing.

4,576,917

METHOD FOR ANALYSIS OF ADDITIVES IN POLYOLEFINS

John F. Schabron, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 17, 1980, Ser. No. 187,873
Int. Cl.[4] G01N *30/14, 33/44*
U.S. Cl. 436—85 12 Claims

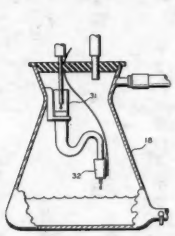
1. A process for the analysis of hindered phenol antioxidants in polyolefins consisting essentially of:

(a) dissolving the polyolefin in hot decalin;

(b) cooling the polyolefin decalin solution by indirect heat exchange to precipitate the polyolefin;

(c) recovering from the resulting decalin solution a portion that is substantially free of polyolefin;

(d) separating said portion into various chemical components; and



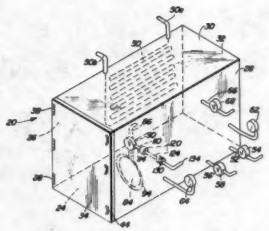
(e) determining the relative amounts of the components by means of a detector.

4,576,918

METHOD OF SAMPLING AND ANALYZING BIOCIDAL GAS FROM A REACTION CHAMBER

Anthony C. Yeung, D4 Greenville Gardens 22/F, Shiu Fai Terrace, Hong Kong

Filed Feb. 2, 1983, Ser. No. 463,286
Int. Cl.[4] G01N *1/24*
U.S. Cl. 436—179 4 Claims



1. A method of determining the composition and concentration of a biocidal gas present in a reaction chamber during processing of material contained in the chamber and exposed to the biocidal gas,

said method comprising the steps of

covering a valved, fixed-volume, reuseable gas sampling vessel having an interior with an enveloping jacket as an insulating layer therefor,

evacuating said vessel,

placing the evacuated vessel within a reaction chamber containing articles to be processed,

providing a remotely operable valve control means accessible outside of the reaction chamber,

coupling said remotely operable valve control means to the valve of said sampling vessel in the reaction chamber for selectively manipulating the valve,

closing the reaction chamber and introducing article-treating biocidal gas thereinto for processing material contained in the chamber,

establishing gaseous flow communication between the interior of said evacuated sampling vessel and the reaction chamber by manipulating the valve of said valved vessel through said remotely operable valve control means to open the valve,

holding the valve in an open position for a finite time period sufficient to allow a gaseous atmosphere present in the reaction chamber to diffuse into and to fill said sampling vessel and to establish equilibrium between gases in said sampling vessel and in said chamber,

closing the valve of said valved gas sampling vessel to trap

and to seal therewithin an aliquot of the gaseous atmosphere present in said reaction chamber,

retrieving the gas-filled sampling vessel from said reaction chamber, and analyzing the gas contained in said vessel.

4,576,919

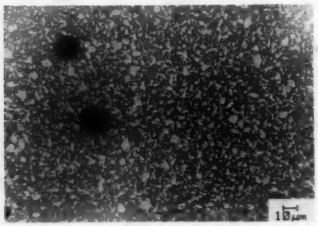
ZIRCON-CORDIERITE COMPOSITE CERAMIC

James D. Hodge, Cohoes, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,702

Int. Cl.⁴ C03C *10/08;* **C04B** *35/48*

U.S. Cl. 501—9 **25 Claims**



1. A process for producing a polycrystalline body having a thermal expansion coefficient of less than 4.2×10^{-6} K. at 300° K. consisting essentially of from about 45% by weight to about 95% by weight of polycrystalline zircon phase, from about 5% by weight to about 55% by weight of polycrystalline cordierite phase, up to about 5% by weight of a phase of a nucleating agent, and less than about 2% by volume of a glassy phase which consists essentially of forming a mixture consisting essentially of zircon and/or ZrO_2, Al_2O_3, MgO and SiO_2 and a nucleating agent, said zircon and/or ZrO_2, Al_2O_3, MgO and SiO_2 being used in amounts required to produce said polycrystalline zircon phase and said polycrystalline cordierite phase of said polycrystalline body, shaping said mixture into a compact, sintering said compact at a temperature ranging from about 1290° C. to about 1550° C. at which sufficient liquid phase is generated to liquid phase sinter the compact and produce a densified body having a density greater than about 85% of the theoretical density of said body, said sintering temperature having no significant deleterious effect on said compact or body, said sintered body containing said zircon phase and a glassy phase of said cordierite, nucleation-annealing said sintered body at a temperature ranging from about 600° C. to about 800° C. to nucleate said glassy cordierite phase, crystallization-annealing the resulting nucleated body at a temperature ranging from about 1200° C. to below the temperature at which liquid phase forms in said body to produce said polycrystalline body, said nucleating agent being an agent for nucleating said glassy cordierite phase, said nucleating agent being used in an amount sufficient to nucleate said glassy cordiertie phase to produce said polycrystalline body, said sintering, said nucleation-annealing and said crystallization-annealing being carried out in an atmosphere or vacuum which has no significant deleterious effect on said compact or body.

4,576,920

B_2O_3—P_2O_5—SiO_2 GLASS-CERAMICS

John F. MacDowell, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

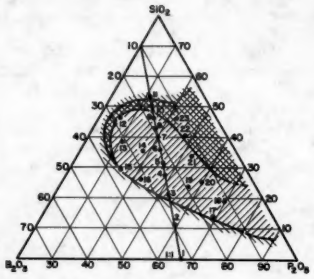
Filed May 23, 1985, Ser. No. 737,204

Int. Cl.⁴ C03C *10/02, 3/097, 3/064*

U.S. Cl. 501—10 **2 Claims**

1. A transparent, translucent, or opaque glass-ceramic article containing BPO_4 as the predominant crystal phase consisting essentially, expressed in terms of weight percent on the oxide basis, of about

SiO_2: 10–50



B_2O_3: 5–35

P_2O_5: 25–75

$SiO_2+P_2O_5+B_2O_3$: >90.

4,576,921

PREPARATION OF DISPERSIONS AND CERAMICS FROM HYDRATED METAL OXIDES

Edward S. Lane, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 12, 1983, Ser. No. 522,695

Claims priority, application United Kingdom, Aug. 13, 1982, 8223390; Jun. 28, 1983, 8317565

Int. Cl.⁴ C03C *3/00, 3/04;* **C01B** *13/14;* **B01J** *13/00*

U.S. Cl. 501—12 **12 Claims**

1. A process for the preparation of a dispersion which comprises contacting a hydrated metal oxide having an acidic function with a quaternary ammonium hydroxide in an amount sufficient to peptise the hydrated metal oxide to form a dispersion.

4,576,922

HIGH EXPANSION DENTAL CROWN CORE CERAMIC COMPOSITION

William J. O'Brien, and Matthew T. O'Brien, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 440,799, Jan. 5, 1983, abandoned. This application Jan. 9, 1985, Ser. No. 690,400

Int. Cl.⁴ C03C *14/00*

U.S. Cl. 501—32 **6 Claims**

1. A ceramic composition characterized by a coefficient of thermal expansion in the temperature range from 25° C. to 500° C. of between about 14×10^{-6}/°C. to about 16×10^{-6}/°C. and further characterized by a transverse strength of about 18,000 psi or greater comprising from about 40 to 60% by weight of a finely ground, magnesium oxide dispersed in silicate glass matrix containing at least 3% by weight of zirconium oxide, titanium oxide, or mixtures thereof.

4,576,923

METHOD OF MANUFACTURING PARTS OR POWDERS OF A NITRIDE COMPOUND OF SILICON OR OF A METAL BY REACTING SILICON OR METAL PARTS OR POWDERS IN THE SOLID STATE WITH A NITROGEN-CONTAINING REACTIVE GAS

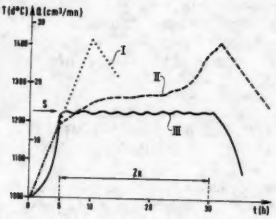
Daniel Broussaud, Villebon sur Yvette; William Mustel, Palaiseau, and Louis Minjolle, Tarbes, all of France, assignors to Armines and Ceraver, both of Paris, France

Filed Apr. 10, 1984, Ser. No. 598,912

Claims priority, application France, Apr. 13, 1983, 83 05993

Int. Cl.⁴ C04B *35/58*; F27D *19/00*

U.S. Cl. 501—98 **7 Claims**



1. A method of nitriding a material selected from the group consisting of silicon, metals, and mixtures thereof into a compound of said material by an exothermic reaction with a nitrogen-containing reactive gas, the method including initially heating the material in a reaction zone in the presence of said reactive gas so as to raise the temperature of the material to an exothermic reaction triggering temperature, delivering sufficient reactive gas to the reaction zone in contact with the material to completely transform by said exothermic reaction the material to said compound, and controlling the rate of said exothermic reaction so as not to exceed a preselected maximum reaction temperature above which complete transformation of the material would not occur, wherein the step of controlling the rate of said exothermic reaction comprises:

maintaining the consumption rate of the reactive gas substantially constant from the start of the exothermic reaction until the transformation has been completed at a level predetermined so as to allow the reaction temperature to increase up to, but not to exceed, said preselected maximum temperature.

4,576,924

PROCESS FOR THE DESORPTION OF SPENT SOLID ABSORBENT

Manfred Koch, Holzwickede; Ludwig Mühlhaus, Iserlohn; Rolf Lambach, Hagen, and Horst Grochowski, Oberhausen, all of Fed. Rep. of Germany, assignors to UHDE GmbH, Dortmund, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 306,962

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037187

Int. Cl.⁴ B01J *20/34*; B65G *27/00*; B01F *11/00*; C01B *31/08*

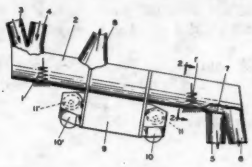
U.S. Cl. 502—56 **1 Claim**

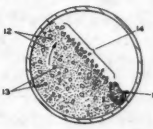
1. A process for the desorption of spent solid absorbent medium through heating the latter to desorption temperature, the improvement comprising the steps of:

(a) introducing a spent absorbent medium and a hot carrier medium into an upper end of an inclined material carrier to form a mixture comprised of particles;

(b) immediately tumbling the spent absorbent medium and the hot carrier medium mixture in a revolving path as the media are introduced into the upper end of the inclined material carrier; and

(c) subjecting the mixture to periodic linear vibrational forces which act on the particles of the mixture as the mixture travels along the inclined material carrier for causing relative mixing of the particles as well as mixing of





the particles in a revolving path as the mixture moves along the inclined material carrier.

4,576,925

CATALYST FOR PURIFYING GASES FROM HYDROGEN SULPHIDE

Tofik G. O. Alkhazov, Baku; Jury P. Korotaev, Moscow, and Albert A. Vartanov, Baku, all of U.S.S.R., assignors to Azerbaidzhansky Institut Nefti I Khimii Imeni Azizbekova, Baku, U.S.S.R.

Division of Ser. No. 613,892, May 24, 1984, Pat. No. 4,519,992. This application Feb. 14, 1985, Ser. No. 701,563

Claims priority, application U.S.S.R., May 26, 1983, 3591260

Int. Cl.⁴ B01J *21/06, 23/80, 23/86*

U.S. Cl. 502—307 **5 Claims**

1. A catalyst useful in the oxidation of hydrogen sulphide contained in gases, said catalyst comprised of the following components in percent by weight:

titanium dioxide	10–30
iron oxide	20–30
zinc oxide	20–25
chromium oxide	20–50

4,576,926

CATALYTIC HOLLOW SPHERES

Taylor G. Wang, Glendale; Daniel D. Elleman, San Marino; Mark C. Lee, La Canada, and James M. Kendall, Jr., Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 23, 1984, Ser. No. 602,901

Int. Cl.⁴ B01J *23/40, 35/08*

U.S. Cl. 502—339 **5 Claims**

1. A heterogeneous catalyst comprising hollow, spherical, gas-impervious particles comprising a metal shell containing a gas at a pressure above atmospheric and having a layer of catalyst on the surface thereof.

4,576,927

POROUS ADSORBENT FOR ADSORBING LOW DENSITY LIPOPROTEINS

Toru Kuroda, and Naokuni Yamawaki, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1984, Ser. No. 668,795

Claims priority, application Japan, Nov. 25, 1983, 58-220532; Jan. 18, 1984, 59-5678; May 16, 1984, 59-96375; May 17, 1984, 59-97501; May 18, 1984, 59-98597

Int. Cl.[4] B01J 20/22

U.S. Cl. 502—402 15 Claims

1. A porous adsorbent for adsorbing thereonto a low density lipoprotein:

which comprises a carrier surface and, linked with the surface, at least one member selected from a silanol group and a synthetic polyanion member having a chain structure and a molecular weight of 600 or more, said synthetic polyanion member having at least one functional group selected from the group consisting of a carboxyl group, sulfonic group and phosphoric acid group, said adsorbent satisfying at least one requirement selected from the group consisting of such requirement that the silanol group is present on the surface at a density of 0.8 to 7.5 $\mu mol/m^2$ and such requirement that the amount of the negative charge of the synthetic polyanion member relative to that of the adsorbent is 1×10^{-6} to 1×10^{-3} equivalent per ml of the adsorbent; and

which has pores, the pore diameters of pores occupying 70% or more of pore volume based on the total pore volume of the adsorbent being distributed in the range of 20 nm to 1,250 nm, the pore volume of pores of a pore diameter in the range of 0.8 D to 1.2 D in which D represents the pore diameter of any one of pores having pore diameters in the range of 20 nm to 1,250 nm being less than 80% based on the total pore volume of the adsorbent.

4,576,928

ADSORBENT AND PROCESS FOR PREPARING THE SAME

Nobutaka Tani, Minoo, and Tsuneo Hayashi, Ashiya, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1983, Ser. No. 557,061

Claims priority, application Japan, Dec. 2, 1982, 57-212379; Feb. 25, 1983, 58-31194; Apr. 18, 1983, 58-68116; Apr. 21, 1983, 58-70967; Oct. 5, 1983, 58-187365

Int. Cl.[4] B01J 20/22

U.S. Cl. 502—404 15 Claims

1. An adsorbent for removing a substance to be removed from body fluid in extracorporeal circulation treatment comprising a porous cellulose gel on which a ligand having an affinity for the substance is immobilized by a covalent linkage by reacting the porous cellulose gel with epichorohydrin or a polyoxirane compound to introduce epoxy groups into the gel and reacting the resulting epoxy-activated gel with the ligand.

4,576,929

ACTIVE CARBON FIBERS AS ADSORBENT FOR WATER PURIFICATION

Kenji Shimazaki, Shizuoka, Japan, assignor to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,955

Claims priority, application Japan, Dec. 22, 1983, 58-240874

Int. Cl.[4] B01J 20/20

U.S. Cl. 502—417 11 Claims

1. Active carbon fibers derived from acrylic fibers and having a BET specific surface area (SA) of from 800 to 2,000 m^2/g, a ratio of pore volume (Vp) to (SA) of from 5×10^{-4} to 14.5×10^{-4}, and a methylene blue adsorption rate constant of not less than 5×10^{-1} sec^{-1}.

4,576,930

TRANSFUSION PREPARATION FOR INTRAVENOUS INFUSION

Tohru Sugiyama; Yasuo Suzuki; Katsumasa Katagiri, all of Shimizu, and Satoshi Furutani, Yaizu, all of Japan, assignors to Shimizu Pharmaceutical Co., Ltd., Shimizu, Japan

Filed Jul. 7, 1983, Ser. No. 511,494

Claims priority, application Japan, Jul. 20, 1982, 57-127215

Int. Cl.[4] A61K 31/70

U.S. Cl. 514—23 7 Claims

1. In a transfusion preparation containing glucose and electrolytes for intravenous infusion, the improvement comprising the preparation containing a salt of citric acid, salicylic acid, ethylenediaminetetraacetic acid or lactic acid as a chelating agent, and a pharmaceutically acceptable, water-soluble glycerophosphate, glucose-1-phosphate or glucose-6-phosphate as a phosphorous source, and having a pH of 5 to 7.5.

4,576,931

23-C-SUBSTITUTED MYCAMINOSYL TYLONOLIDE, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

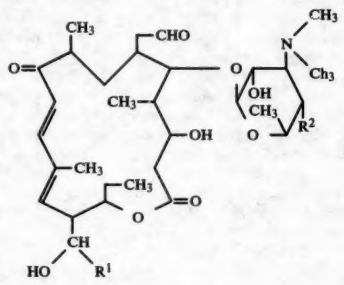
Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Kanagawa; Tomio Takeuchi, Tokyo; Akihiro Tanaka, Tokyo, and Shuichi Sakamoto, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation), Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,286

Int. Cl.[4] A61K 31/78; C07H 17/08

U.S. Cl. 514—30 13 Claims

1. A 23-C-substituted mycaminosyl tylonolide compound of the following formula:



(I)

wherein R^1 represents lower alkyl, aryl, lower alkenyl or lower alkynyl, R^2 represents hydrogen or hydroxyl.

4. A method of producing an antibacterial activity against bacteria by administering a compound of claim 1 to a host in need of such treatment.

4,576,932

DIETARY SUPPLEMENT AND METHOD

Paolo Sorbini, Milan, Italy, assignor to Also Laboratori S.A.S., Italy

Filed Jan. 11, 1983, Ser. No. 457,156

Int. Cl.[4] A61K 31/715

U.S. Cl. 514—54 7 Claims

1. A method for inhibiting an insulin rebound effect in a subject comprising the steps of fasting by said subject from insulin-stimulating carbohydrates for a period to reduce the insulin present in the bloodstream of said subject to near a basal insulin level; orally administering to said subject a dietary supplement, said dietary supplement comprising fructose, milk protein and guar gum, said fructose and guar gum being present in amounts effective to inhibit said insulin rebound effect, and wherein carbohydrates in said dietary supplement consist essentially of substances which do not stimulate insulin produc-

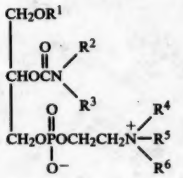
tion; and fasting by said subject for a period subsequent to said oral administration from insulin-stimulating carbohydrates, said dietary supplement being effective to maintain said insulin present in the bloodstream of said subject near said insulin basal level during said period of fasting, thereby inhibiting said insulin rebound effect.

4,576,933
METHOD OF USE OF 1-(ALKYL FOR ALKYLCARBANOYL)-2-CARBAMOYLGLYCEROL DERIVATIVES

Susumu Tsushima, Suita, and Kohei Nishikawa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 29, 1983, Ser. No. 490,224
Claims priority, application Japan, May 6, 1982, 57-76224
Int. Cl.⁴ A61K *31/42, 31/425, 31/44, 31/685*
U.S. Cl. 514—77 **17 Claims**

1. A method of treatment of hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of the formula



wherein

R^1 is alkyl or alkylcarbamoyl containing 10 to 30 carbon atoms,

R^2 and R^3 are independently hydrogen or C_{1-6} alkyl

or wherein NR^2R^3 are piperidino, morpholino, thiomorpholino, 1-piperazinyl, 1-pyrrolidinyl, 1-azetidinyl or 1-azilidinyl and

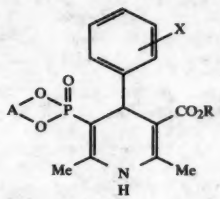
is a pyridinio, oxazolio, thiazolio, pyridazinio, quinolinio, isoquinolinio, N-methylmorpholinio, morpholinio, N-methylpiperazinio or piperazinio group, each of said groups being unsubstituted or substituted by one C_{1-4} alkyl, hydroxy, hydroxyethyl, aminoethyl, amino, imino, carbamoyl or ureido group, or a pharmaceutically acceptable salt thereof.

4,576,934
ANTIHYPERTENSIVE DIHYDROPYRIDINE-5-PHOSPHONIC ACID CYCLIC ESTERS

Kiyotomo Seto, Funabashi; Sakuya Tanaka, Hasuda, and Ryozo Sakoda, Kashiwa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,473
Claims priority, application Japan, Sep. 26, 1983, 58-177710; Aug. 3, 1984, 59-163649
Int. Cl.⁴ C07F *9/58;* **A61K** *31/675*
U.S. Cl. 514—85 **9 Claims**

1. A compound of the formula:



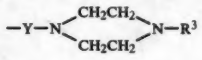
(I)

wherein

X is hydrogen, nitro, trifluoromethyl, fluorine, chlorine, bromine, or iodine;

A is 1,3-propylene or 1,4-butylene which may be substituted by C_1–C_3 alkyl;

R is C_1–C_4 alkyl, —Y—$N(R^1)(R^2)$ or



wherein each of R^1, R^2 and R^3, which may be the same or different, and is hydrogen, C_1–C_6 alkyl, or aralkyl; and Y is C_2–C_6 alkylene; and

Me is methyl; or its pharmaceutically acceptable salt.

6. An antihypertensive, coronary or peripheral vasodilator composition comprising

(a) an antihypertensive, coronary or peripheral vasodilator effective amount of the compound of claim **1**; and

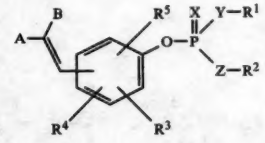
(b) a pharmaceutically acceptable diluent or carrier.

4,576,935
DIHALOVINYLPHENYL PHOSPHATES AND THEIR USE AS PESTICIDES

Gerd-Ulrich Schwarz, Schifferstadt, and Heinrich Adolphi, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,855
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239288
Int. Cl.⁴ A01N *57/06;* **C07F** *9/09*
U.S. Cl. 514—113 **7 Claims**

1. A dihalovinylphenyl phosphate of the formula



I

where A and B independently of one another are each fluorine, chlorine and bromine, or trihaloalkyl of 1 to 4 carbon atoms, X is oxygen or sulfur, Y and Z independently of one another are each oxygen, sulfur or the divalent radical —NH—, R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl, haloalkyl, alkoxyalkyl, alkylthioalkyl of 1 to 6 carbon atoms, and R^3, R^4 and R^5 independently of one another are each hydrogen, halogen, nitro, cyano, alkyl, alkoxy, alkylthio, trihaloalkyl or trihaloalkoxy of 1 to 4 carbon atoms.

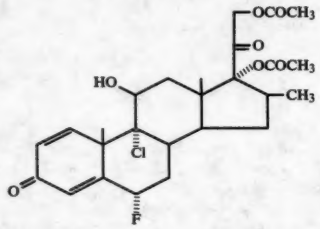
2. A method of combating insects which comprises: applying to the insects or their habitat an effective amount of a compound of the formula I as defined in claim **1**.

4,576,936
6α-FLUORO-9α-CHLORO-PREDNISOLONE 17,21-DIESTERS

Peter MacDonald, Arese, Italy, assignor to Sterosynt Ltd., Bristol, Great Britain

Continuation of Ser. No. 207,807, Nov. 17, 1980, abandoned.
This application Mar. 23, 1982, Ser. No. 361,119
Claims priority, application Italy, Nov. 16, 1979, 27353; Oct. 9, 1980, 49853
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—180 1 Claim

1. A method of treating an inflammatory condition in a warm-blooded animal responsive to treatment with antiinflammatory agents, which comprises administering to said animal a nontoxic, antiinflammatory effective amount of 6-α-fluoro-9-α-chloro-prednisolone 17,21-diester of formula I



(I)

4,576,937
7-D-MANDELAMIDO-3(1-SULFOMETHYLTETRAZOL-5-YL)THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID MONOSODIUM SALT

Theodore J. Polansky, Harleysville, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Feb. 29, 1984, Ser. No. 584,590
Int. Cl.[4] C07D *501/48;* A61K *31/545*
U.S. Cl. 514—204 16 Claims

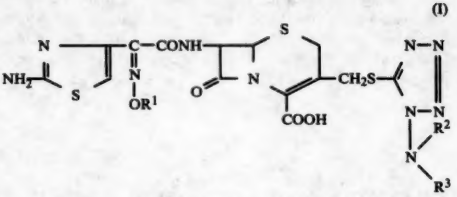
1. 7-D-Mandelamido-3-(1-sulfomethyltetrazol-5-yl)-thiomethyl-3-cephem-4-carboxylic acid monosodium salt, and hydrates and solvates thereof.

4,576,938
CEPHALOSPORIN COMPOUND AND PROCESS FOR PREPARING THE SAME

Mitsuyoshi Wagatsuma, Urawa; Susumu Hatsuno, Kawaguchi; Totaro Yamaguchi, Urawa, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 8, 1982, Ser. No. 447,809
Claims priority, application United Kingdom, Dec. 8, 1981, 8137018; Nov. 2, 1982, 8231243
Int. Cl.[4] A61K *31/545;* C07D *501/56*
U.S. Cl. 514—206 5 Claims

4. An antibacterial composition comprising an effective antibacterial amount of the cephalosporin compound selected from the group consisting of a (Z) isomer of a compound of the formula:



(I)

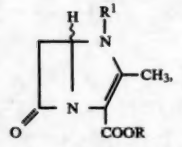
wherein R^1 is methyl or tetrazolylmethyl and R^2 and R^3 are a hydrogen atom, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

4,576,939
PENEM DERIVATIVES

Barry C. Ross, Luton, and Graham Johnson, Milton Keynes, both of United Kingdom, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 217,819, Dec. 18, 1980, abandoned.
This application Nov. 8, 1982, Ser. No. 439,898
Claims priority, application United Kingdom, Dec. 20, 1979, 7943995
Int. Cl.[4] A61K *31/415;* C07D *487/04*
U.S. Cl. 514—210 10 Claims

1. A penem compound of the formula



wherein

R is a carboxyl esterifying group removable by hydrolysis, reduction, or enzymatic action, or is a pharmaceutically acceptable cation; and

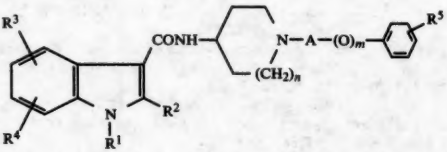
R^1 is alkyl having 1 to 4 carbon atoms or such alkyl substituted by —CN or —COO(C_1–C_4-alkyl), or is phenyl or phenyl mono- or di-substituted by the same or different substituents which are —CN, halogen, or —COO(C_1–C_4-alkyl).

4,576,940
ANTI-ALLERGIC 3-INDOLECARBOXAMIDES

Tetsuya Tahara; Tsuguo Ikebe; Michio Terasawa, and Tomonori Imayoshi, all of Oita, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Aug. 10, 1984, Ser. No. 639,292
Claims priority, application Japan, Sep. 14, 1983, 58-170061
Int. Cl.[4] A61K *31/55, 31/445;* C07D *401/12*
U.S. Cl. 514—212 11 Claims

1. A 3-indolecarboxamide compound of the formula:



inclusive of compounds selected from the group consisting of pharmaceutically acceptable acid addition salt forms thereof,

and hydrate forms thereof, wherein R^1 is a C_{1-8} alkyl group, a C_{3-8} cycloalkyl group, a C_{3-8} cycloalkyl-C_{1-8} alkyl group, an allyl group, a propargyl group, or a phenyl or phenyl-C_{1-4} alkyl group which may be optionally substituted, on the benzene ring, by at least one substituent selected from the group consisting of a halogen atom, a trifluoromethyl group, a C_{1-4} alkyl group and a C_{1-4} alkoxy group; R^2 is a hydrogen atom or a C_{1-6} alkyl group; R^3 is a hydrogen atom, a halogen atom, a C_{2-6} alkanoyloxy group, a benzoyloxy group, a C_{1-4} alkoxy group, a benzyloxy group, a hydroxyl group or a C_{1-4} alkyl group; R^4 is a hydrogen atom, a halogen atom, a C_{1-4} alkyl group, a C_{1-4} alkoxy group or a hydroxyl group; R^5 is a hydrogen atom or a C_{1-4} alkoxy group; A is an ethylene or trimethylene group, which may be optionally substituted by a C_{1-4} alkyl group, n is zero, 1 or 2; and m is zero or 1.

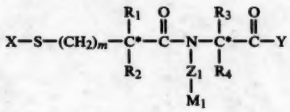
9. A pharmaceutical composition for the prevention or treatment of allergic diseases containing an anti-allergic effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,576,941
COMPOUNDS FOR TREATING HYPERTENSION

John T. Suh, Greenwich, Conn.; John J. Piwinski, Parsippany, N.J.; Howard Jones, Ossining, N.Y., and Edward S. Neiss, New Canaan, Conn., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,576
Int. Cl.[4] A61K *31/54*; C07D *417/12, 413/12, 401/12*
U.S. Cl. 514—222 23 Claims

1. A compound of the formula



(I)

or a pharmaceutically acceptable alkali metal, alkaline earth metal, or acid addition salt thereof, wherein

X is hydrogen or

wherein

A is alkyl, phenyl, or phenyl substituted with up to 3 substituents selected from the group consisting of halo, alkyl having up to 7 carbon atoms, —CF_3, OH, COOH, NH_2, and SO_2NH_2;

m is 0 to 3 inclusive;

Y is —OR or —N(R)R;

R_1, R_2, R_3 and R_4 are independently R or amino-alkyl,

Z_1, reading toward the M_1 substituent, is selected from the group consisting of $-(CH_2)_n-$, $-N(R)CH_2(CH_2)_n-$, $-N(R)CH_2(CH_2)_nNH-$, $-(CH_2)_nSO_2-$, $-(CH_2)_nN(R)SO_2-$, $-(CH_2)_n-N(R)-$, $-(CH_2)_nN(R)C(O)-$, $-(CH_2)_nC(O)N(R)-$, or $-(CH_2)_nC(O)-$, in which n is 0 to 6 inclusive, and one of the (CH_2) groups can be mono- or disubstituted with methyl or ethyl;

M_1 is a 1,2,4-benzothiadiazine-1,1-dioxide group having two or three substituents selected from the group consisting of halogen, alkyl, aminoalkyl, aralkyl, cycloalkyl, alkylamino, acylamino, acylaminoalkyl, acylaminoalkylamino, trifluoromethyl, nitro, cyano, —OR, —SR, —C(O)OR, —S(O)R, —SO_2R, —C(O)N(R)R, —N(R)R, or —SO_2N(R)R;

wherein in each occurrence R is independently hydrogen, alkyl, cycloalkyl, aryl, aralkyl, heteroalkyl, heteroaralkyl, or heteroaryl;

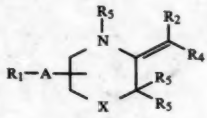
wherein the alkyl groups and the alkyl moieties contain up to 7 carbon atoms, the cycloalkyl and heterocyclic groups and moieties are saturated or unsaturated and contain 3 to 12 atoms, the aryl groups and moieties are selected from the group consisting of phenyl, tolyl, indanyl, naphthyl, tetrahydronaphthyl and decanhydronaphthyl; and the heteroaryl groups and moieties are selected from the group consisting of indolyl, indolinyl, pyridyl, pyrrolidyl, pyrrolyl, morpholino, furyl, tetrahydrofuryl, thienyl, imidazolyl, quinolyl, isoquinolyl, benzimidazolyl, and tetrahydroisoquinolyl.

4,576,942
ANTI-ALLERGIC AND ANTI-INFLAMMATORY BI- AND TRI- CYCLO-1,4-THIAZINE DERIVATIVES, COMPOSITION, AND METHOD OF USE THEREFOR

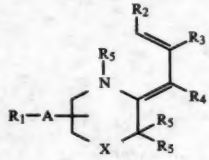
Raymond D. Youssefyeh, Tarrytown, N.Y., assignor to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,048
Int. Cl.[4] A61K *31/38, 31/54*; C07D *279/16, 513/02*
U.S. Cl. 514—222 5 Claims

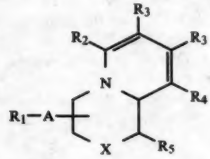
1. A member of the formulae:



I



II



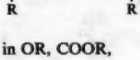
III

wherein,

A is benzo or pyrido;

X is S;

R_1 is H, C_1–C_6 alkyl, OH, OR, halogen, nitro, COOR,



wherein R in OR, COOR,

denotes lower alkyl having 1 to 6 carbon atoms;

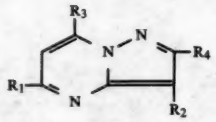
R_2, R_3, R_4 and R_5 are identical or different and each represent H, C_1–C_6 alkyl, OH, OR, cyano, halogen, or COOR, wherein R in OR and COOR denotes lower alkyl having 1 to 6 carbon atoms; and pharmaceutically acceptable salts thereof.

4,576,943
PYRAZOLO[1,5-a]PYRIMIDINES

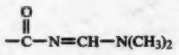
Andrew S. Tomcufcik, Old Tappan, N.J.; Walter E. Meyer, Suffern; John P. Dusza, Nanuet, both of N.Y., and Shin S. Tseng, Bridgewater, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 659,069
Int. Cl.[4] A61K *31/505, 31/535, 31/54;* C07D *471/04*
U.S. Cl. 514—222 22 Claims

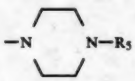
1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, methyl or trifluoromethyl, R_2 is cyano, carbamoyl or moiety of the formula:



R_3 is phenyl, 3-chlorophenyl, 4-chlorophenyl, 3-trifluoromethylphenyl, 3-pyridyl or 4-pyridyl, and R_4 is 1-piperidino, 4-benzyl-1-piperidino, 4-thiomorpholino, 4-morpholino or a piperazino moiety of the formula:



wherein R_5 is methyl, phenyl, 2-pyridyl, 2-furanylmethyl, 3-phenyl-2-propenyl, benzyl, 3-chlorobenzyl, 4-chlorobenzyl, 3,4-dichlorobenzyl, 2,6-dichlorobenzyl, 3-methoxybenzyl, 4-methoxybenzyl, β-hydroxyethyl, 2-phenoxyethyl, 3-phenoxypropyl or 4-phenoxybutyl with the proviso that when R_1 is methyl or trifluoromethyl then R_3 is phenyl or 4-pyridyl and R_4 is 4-benzyl-1-piperazinyl; and the pharmacologically acceptable acid-addition salts thereof.

17. A method of lowering blood pressure in a mammal which comprises administering to said mammal an effective hypotensive amount of a compound of claim 1.

4,576,944
4-ETHYL-2-HYDROXY-3-METHYL-2-PHENYLMORPHOLINE, COMPOSITIONS AND USE

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Filed Oct. 12, 1984, Ser. No. 660,218
Claims priority, application France, Oct. 17, 1983, 83 16485
Int. Cl.[4] A61K *31/535;* C07D *265/32*
U.S. Cl. 514—238 4 Claims

1. A 2-hydroxy-2-phenylmorpholine derivative selected from the group consisting of:

(i) 4-ethyl-2-hydroxy-3-methyl-2-phenylmorpholine; and

(ii) non-toxic addition salts thereof.

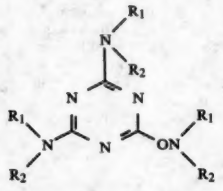
3. A method of treatment of depression which comprises administering a pharmaceutically effective amount of a compound according to claim 1.

4,576,945
HEXAALKYLMELAMINE-AMINO-OXY COMPOUNDS

Mark E. Sanders, 1740 Shaleh Meadows Rd. Apt. 9D, Holladay, Utah 84117

Continuation-in-part of Ser. No. 436,682, Oct. 26, 1982, abandoned. This application Jan. 3, 1984, Ser. No. 567,475
Int. Cl.[4] C07D *251/52;* A61K *31/53*
U.S. Cl. 514—245 19 Claims

1. A compound having the formula:



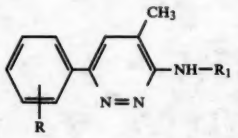
wherein R_1 and R_2 are independently lower alkyl.

4,576,946
DERIVATIVES OF 4-METHYL 6-PHENYL PYRIDAZINE ACTIVE ON THE CENTRAL NERVOUS SYSTEM

Camille G. Wermuth, Strasbourg; Kathleen Biziere, Clapiers, and Horace Davi, St. Gely du Fesc, all of France, assignors to Sanofi, France

Filed Aug. 4, 1982, Ser. No. 405,169
Claims priority, application France, Aug. 10, 1981, 81 15435
Int. Cl.[4] C07D *237/20, 413/12;* A61K *31/50*
U.S. Cl. 514—247 6 Claims

1. Compounds of 4-methyl 6-phenyl pyridazine of the formula:

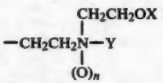


(I)

in which:

R is H or OH

R_1 represents the group



where

N=0 or 1

X=H and

Y=H or lower alkyl of 1–4 carbon atoms.

3. A pharmaceutical composition for the treatment of depressive states which contains at least one product of claim 1.

4,576,947

PHARMACEUTICAL COMPOSITIONS

Heinz-Joachim Hinze, Auringen; Alfons Söder, Frankfurt-Schwanheim, and Kurt Popendiker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

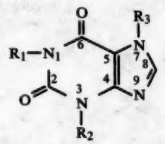
Continuation of Ser. No. 774,648, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 485,870, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 330,653, Feb. 8, 1973, abandoned. This application Nov. 10, 1983, Ser. No. 543,114

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1972, 1810705; Feb. 19, 1972, 2207860; Jul. 11, 1973, 2335170

Int. Cl.[4] A61K *31/52*

U.S. Cl. 514—263 20 Claims

1. A pharmaceutical composition containing as one of plural components and as sole essential active ingredient, a cerebral-blood-flow-increasing amount of a compound of the formula



(I)

wherein

R_1 is a member selected from the group consisting of ω-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, unbranched (ω-1)-hydroxyalkyl having 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, methyl and —H;

R_2 is a member selected from the group consisting of ω-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, unbranched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, and methyl; and

R_3 is a member selected from the group consisting of unbranched ω or (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms, branched (ω-1)-hydroxyalkyl having from 5 to 8 carbon atoms and in which the hydroxyl is separated from the xanthine nucleus by at least two carbon atoms, methyl and —H;

one and only one of R_1, R_2 and R_3 being ω- or (ω-1)-hydroxyalkyl.

4,576,948

COMPOSITION AND METHOD FOR INHIBITING TERMINAL DEOXYRIBONUCLEOTIDYL TRANSFERASE ACTIVITY

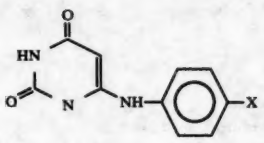
Ronald McCaffrey, Needham; George Wright, Worcester, and Earl F. Baril, Rutland, all of Mass., assignors to Trustees Boston University, Boston, Mass.

Filed Jan. 20, 1983, Ser. No. 459,433

Int. Cl.[4] A61K *31/505*; C07D *239/54*

U.S. Cl. 514—274 4 Claims

1. A process for treating a human patient afflicted with a form of leukemia, the cells of which express terminal deoxynucleotidyl transferase, which comprises administering to the patient a compound of the formula:



wherein X is C_1–C_{10} alkoxy or amino and is effective for the selective inhibition of terminal deoxynucleotidyl transferase in an amount effective to prevent proliferation of said cells in vivo.

4,576,949

USE OF 5,6,7,8-TETRAHYDROQUINOLINES AND 5,6-DIHYDROPYRINDINES AS LEUKOTRIENE AND LIPOXYGENASE INHIBITORS AND THE NOVEL 3-SUBSTITUTED COMPOUNDS THEREIN

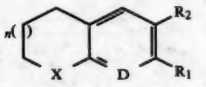
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 7, 1984, Ser. No. 607,500

Int. Cl.[4] A61K *31/41*; C07D *221/20, 215/54, 215/20*

U.S. Cl. 514—277 18 Claims

1. A compound having the formula



I

wherein

D is N or N→O;

wherein

n is an integer 0 or 1;

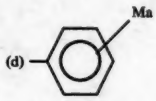
wherein

R_1 is

(a) hydrogen,

(b) alkyl of from 1 to 4 carbons; inclusive,

(c) cyclopropyl,



IX

wherein a is an integer 0-2, inclusive, and wherein M is

(i) hydrogen,

(ii) halo,

(iii) trifluoromethyl,

(iv) S—CH_3,

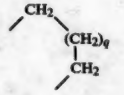
(v) phenyl,

(vi) O—CH_3,

(vii) OH,

(viii) NO_2,

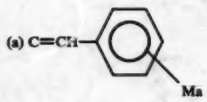
(ix) NR_3R_4 wherein R_3 and R_4 are the same or different and are alkyl of from 1 to 4 carbons, inclusive, acyl, aroyl, hydrogen, or are taken together to form



XI

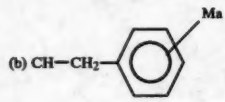
wherein q is an integer 2 or 3, except that when one of R_3 or R_4 is acyl or aroyl, the other of R_3 or R_4 cannot be acyl or aroyl,

(x) $OCOCH_3$,
(xi) $OCOC_6H_5$,
(xii) $O—Si(CH_3)_2C(CH_3)_3$; and
wherein
R_2 is
(a) $COOR_5$ wherein R_5 is
(i) hydrogen,
(ii) alkyl of from one to four carbons, or
(iii) a pharmaceutically acceptable cation,
(b) CH_2OH,
(c) CHO,
(d) $CH{=}CH{-}(CH_2)_dR_6$ comprising the cis or trans isomer thereof wherein d is an integer 0 through 3, inclusive, and R_6 is CH_2OH, CH_2Cl or CO_2R_5 wherein R_5 is as defined above,
(e) $CH_2CH_2(CH_2)_dR_6$ wherein d and R_6 are as defined above; and
wherein
X is



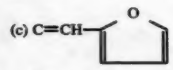
XII

wherein M and a are as defined above except with the proviso that M cannot be NO_2 when D is N, R_2 is $COOR_5$ and n is 1,

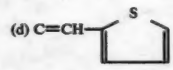


XIII

wherein M and a are as defined above except with the proviso that M cannot be NO_2 when D is N, R_2 is $COOR_5$ and n is 1,

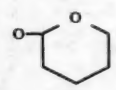


XIV



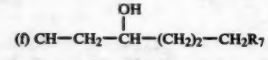
XV

(e) $CH—CH_2—C(O)—(CH_2)_3R_7$ and R_7 is H, OH, Cl,

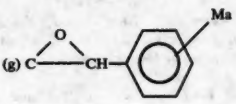


XVI

or $O—Si(CH_3)_2C(CH_3)_3$,

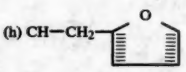


wherein R_7 is as defined above, or



XVII

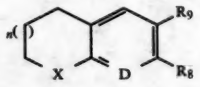
wherein M and a are as defined above;



XVIII/XIX

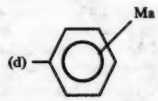
and pharmaceutically acceptable salts thereof.

12. A method for the therapeutic or prophylactic treatment of allergy, asthma, chronic bronchitis, cystic fibrosis, psoriasis, or inflammatory bowel diseases comprising administration of an effective amount of a compound having the formula



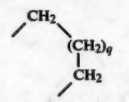
II

wherein
D is N or N→O;
wherein
n is an integer 0 or 1;
wherein
R_8 is
(a) hydrogen,
(b) alkyl of from 1 to 4 carbons; inclusive,
(c) cyclopropyl,



IX

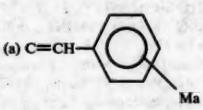
wherein a is an integer 0–2, inclusive, and wherein M is
(i) hydrogen,
(ii) halo,
(iii) trifluoromethyl,
(iv) $S—CH_3$,
(v) phenyl,
(vi) $O—CH_3$,
(vii) OH,
(viii) NO_2,
(ix) NR_3R_4 wherein R_3 and R_4 are the same or different and are alkyl of from 1 to 4 carbons, inclusive, acyl, aroyl, hydrogen, or are taken together to form



XI

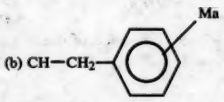
wherein q is an integer 2 or 3, except that when one of R_3 and R_4 is acyl or aroyl, the other of R_3 and R_4 cannot be acyl or aroyl,
(x) $OCOCH_3$,
(xi) $OCOC_6H_5$,
(xii) $O—Si(CH_3)_2C(CH_3)_3$; and
wherein
R_9 is
(a) hydrogen, or alkyl of 1 to 4 carbon atoms,
(b) $COOR_5$ wherein R_5 is

(i) hydrogen,
(ii) alkyl of from one to four carbons, or
(iii) a pharmaceutically acceptable cation,
(c) CH_2OH,
(d) CHO,
(e) $CH{=}CH{-}(CH_2)_dR_6$ comprising the cis or trans isomer wherein d is an integer 0 through 3, inclusive, and R_6 is CH_2OH, CH_2Cl, or CO_2R_5 wherein R_5 is as defined above with the proviso that when R_6 is CO_2R_5 then d cannot be 0,
(f) $CH_2CH_2(CH_2)_dR_6$ wherein d and R_6 are as defined above; and
wherein
X is

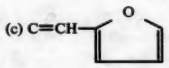


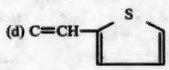
XII

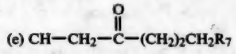
wherein M and a are as defined above,



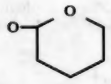
wherein M and a are as defined above,



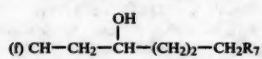




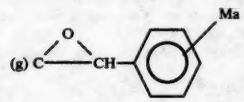
wherein R_7 is H, OH, Cl,



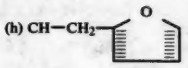
or $O{-}Si(CH_3)_2C(CH_3)_3$,



wherein R_7 is as defined above, or

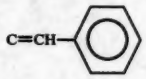


wherein M and a are as defined above;



XVIII/XIX

with the proviso that when R_8 and R_9 are both hydrogen and n is 0 then X cannot be



XII

and with the proviso that when R_8 and R_9 are both hydrogen and n is 1 then M cannot be OC(=O) alkyl of from 1 to 4 carbons, inclusive; and pharmaceutically acceptable salts thereof.

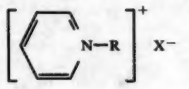
4,576,950

ALKYL PYRIDINIUM SYNERGISTS FOR BENZIMIDAZOLE PESTICIDES

George S. Puritch, Brentwood Bay, and Edward S. Kondo, Orleans, both of Canada, assignors to Safer Agro-Chem Ltd., Victoria, Canada

Filed Dec. 14, 1983, Ser. No. 561,083
Int. Cl.[4] A01N *43/40*
U.S. Cl. 514—358 **9 Claims**

1. A fungicidal composition with increased fungicidal activity, against benomyl tolerant fungi comprising (A) 0.1 to 90% by weight of methyl 1-(n-butylcarbamoyl)-2-benzimidazolecarbamate, and (B) 0.2 to 2 parts by weight of an alkyl pyridinium salt with the formula:



(II)

wherein R represents an alkyl radical containing 12 to 16 carbon atoms and X is a monovalent anion, per part of the benzimidazole, wherein the composition is formulated such that when a further diluted aqueous solution containing 1 to 1,000 ppm of the benzimidazole insecticide is applied to fungi or habitats thereof, the concentration of the alkyl pyridinium salt in the diluted aqueous solution is below its critical micelle concentration level.

4,576,951

PROGLUMIDE, PHARMACEUTICAL PREPARATIONS AND COMPOSITIONS INCLUDING IT FOR USE IN HUMAN PAIN RELIEF

Luigi Rovati; Francesco Makovec; Paolo Senin, and Pierluigi Casula, all of Monza, Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy

Filed Dec. 10, 1984, Ser. No. 680,004
Claims priority, application Italy, Dec. 12, 1983, 68288 A/83
Int. Cl.[4] A61K *31/44, 31/195*
U.S. Cl. 514—282 **8 Claims**

1. A pharmaceutical composition for use in pain relief therapy in humans including proglumide or pharmaceutically-acceptable salt thereof and further including a drug selected from the group consisting of morphine and chemically related opioids, the amount of proglumide being effective to potentiate the analgesic-narcotic activity of said drug, wherein the ratio by weight of proglumide to the said drug is from about 200 to 1.

4,576,952

PYRAZOLOPYRIDINE DERIVATIVES AND THEIR USE AS ANTI-INFLAMMATORY AND/OR ANTI-ALLERGIC AGENTS

Jim Hurst, Sunderland, and Josephine B. May, Nelson, both of England, assignors to Beecham Group p.l.c., Middlesex, England

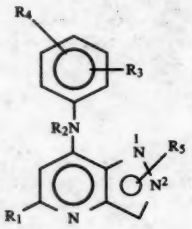
Filed Jan. 23, 1985, Ser. No. 693,731

Claims priority, application United Kingdom, Jan. 25, 1984, 8401868; Nov. 28, 1984, 8430012

Int. Cl.[4] A61K *31/415, 31/44;* C07D *471/04*

U.S. Cl. 514—303 9 Claims

1. A compound of the formula (I) and pharmaceutically acceptable salts thereof:



(I)

wherein:

R_1 is hydrogen, C_{1-6} alkyl or phenyl optionally substituted by halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl;

R_2 is hydrogen or C_{1-6} alkyl;

R_3 is hydroxy, nitro, cyano, C_{2-10} acyloxy, NR_6R_7 wherein R_6 and R_7 are independently selected from hydrogen, C_{1-6} alkyl, C_{2-7} alkanoyl or C_{1-6} alkylsulphonyl; or COR_8 wherein R_8 is hydroxy, C_{1-6} alkoxy or NR_9R_{10} wherein R_9 and R_{10} are independently selected from hydrogen or C_{1-6} alkyl;

R_4 is hydrogen, halogen, CF_3, C_{1-4} alkoxy, C_{1-4} alkyl or any of the groups listed for R_3; and

R_5 is hydrogen, C_{1-4} alkyl or benzyl optionally substituted in the phenyl ring by halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl and is attached at nitrogen atom 1 or 2.

8. A method of treatment of inflammatory conditions in mammals comprising the administration to the mammal of an anti-inflammatory effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,576,953

QUINOLINE DERIVATIVES

David J. Le Count, Congleton, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

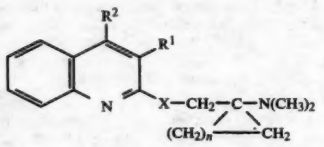
Filed Feb. 23, 1984, Ser. No. 583,035

Claims priority, application United Kingdom, Mar. 29, 1983, 8308601

Int. Cl.[4] A61K *31/47;* C07D *215/22*

U.S. Cl. 514—312 6 Claims

1. A quinoline derivative of the formula:



II

wherein:

X stands for an oxygen or sulphur atom;

n stands for 1 or 2;

R^1 stands for an n-, iso- or s-(3–4C)alkyl radical, or a cyclopropyl radical, or a phenyl radical which may optionally bear a halogeno, (1–4C)alkyl or (1–4C)alkoxy substituent; and

R^2 stands for hydrogen or a (1–4C)alkyl radical;

or a pharmaceutically-acceptable acid-addition salt thereof.

6. A peripherally selective 5-HT antagonist pharmaceutical composition comprising a compound of the formula II stated in claim 1, wherein X, n, R^1 and R^2 have the meanings stated in claim 1, or a pharmaceutically-acceptable acid-addition salt thereof, and an inert pharmaceutically-acceptable diluent or carrier.

4,576,954

ANTI-RHEUMATIC 5-(SUBSTITUTED AMINO)-1,2-DITHIOL-3-ONE COMPOUNDS AND THEIR USE

Jean-Dominique Bourzat; Claude Cotrel, both of Paris; Daniel Farge, Thiais; Jean-Marc Paris, Vaires S/Marne, and Gérard Taurand, Creteil, all of France, assignors to Phone-Poulenc Sante, Courbevoie, France

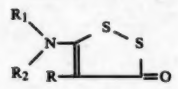
Filed Feb. 21, 1984, Ser. No. 582,043

Claims priority, application France, Feb. 24, 1983, 83 03005

Int. Cl.[4] A61K *31/47;* C07D *215/02, 217/02*

U.S. Cl. 514—314 5 Claims

1. A 5-amino-1,2-dithiol-3-one compound of the formula



in which R represents a hydrogen or chlorine atom and R_1 and R_2, together with the nitrogen atom to which they are bonded, form a 1,2,3,4-tetrahydroquinoline or 1,2,3,4-tetrahydroisoquinoline ring, each being substituted or unsubstituted by a halogen atom, carboxyl, alkoxycarbonyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, trifluoromethyl, cyano, nitro, alkoxy, alkylthio or alkyl radical substituted or unsubstituted by a carboxyl, alkoxycarbonyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, hydroxyl, amino, alkylamino or dialkylamino radical, each of the aforesaid alkyl radicals and alkyl portions hereinbefore mentioned containing 1 to 4 carbon atoms in a straight or branched chain, and, where they exist, its pharmaceutically acceptable acid addition salts, its pharmaceutically acceptable metal salts and its pharmaceutically acceptable addition salts with nitrogen bases.

5. A method of treating rheumatic disease which comprises administering to a subject suffering therefrom or liable thereto an effective amount of a compound according to claim 1.

4,576,955

PYRIDYLALKYLENETHIOPYRIDYLS

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth & Brother, Ltd., Maidenhead, England

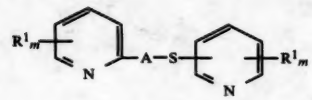
Division of Ser. No. 350,442, Feb. 19, 1982, Pat. No. 4,440,773, which is a continuation-in-part of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Oct. 13, 1983, Ser. No. 541,921

Claims priority, application United Kingdom, Dec. 16, 1978, 7848813

Int. Cl.[4] C07D *401/12;* A61K *31/44*

U.S. Cl. 514—335 5 Claims

1. A compound of the formula



wherein the R^1 groups are, independently, hydrogen, hydroxyl, lower alkyl, hydroxyloweralkyl, loweralkoxy loweralkyl, loweralkoxy, halogen, formyl, phenyl, phenylloweralkyl, halophenyl or $CH(OR^4)_2$, where R^4 is alkyl of 1 to 4 carbon atoms or two R^4 radicals are joined to form a lower alkylene chain; m is 1 or 2; A is a saturated alkylene radical having from 1 to 4 carbon atoms, which may be substituted by lower alkyl of 1 to 6 carbon atoms; S is sulfur; or an acid addition salt thereof, with the proviso that at least one of R^1 is other than hydrogen.

4,576,956
IODO PROPARGYLAMINOISOXAZOLES AS FUNGICIDES

Yasuo Makisumi, Hyogo; Akira Murabayashi; Katsuya Tawara, both of Osaka; Yoshihachi Watanabe, Shiga; Toshio Takahashi, Hyogo, and Takao Konishi, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

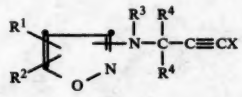
Filed Sep. 9, 1983, Ser. No. 530,883

Claims priority, application Japan, Oct. 5, 1982, 57-176762

Int. Cl.⁴ A61K *31/41;* **C07D** *261/12, 261/20*

U.S. Cl. 514—380 **21 Claims**

1. A compound of the formula I:



(I)

wherein R^1 and R^2 each is hydrogen, C_1–C_{10} alkyl, C_1–C_4 alkoxy, C_3–C_6 cycloalkyl, halogen, A—CH_2—, B—, B—CH_2— or B—CH_2O— wherein A is C_1–C_4 alkoxy or mono- or di- C_1–C_4 alkylamino and B is phenyl, furyl, thienyl or imidazolyl optionally substituted by one or two groups selected from the group consisting of halogen and carboxy;

R^1 and R^2 when taken together may form C_2–C_5 alkylene;

R^3 and R^4 each is hydrogen or C_1–C_4 alkyl; and X is iodine.

4,576,957
N-(SUBSTITUTED PHENYL)-N'-[(1H-IMIDAZOL-1-YL) AND (1H-1,2,4-TRIAZOL-1-YL)ALKYL]UREAS

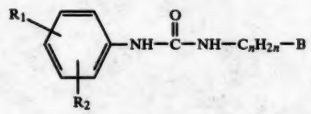
Joseph W. Marsico, Jr., Pearl River, N.Y.; William B. Wright, Jr., Woodcliff Lake, N.J., and Jeffery B. Press, Tuxedo, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 5, 1984, Ser. No. 628,095

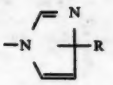
Int. Cl.⁴ A61K *31/41, 31/415;* **C07D** *233/61, 249/08*

U.S. Cl. 514—383 **21 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl, alkyl(C_1–C_3) and alkoxy(C_1–C_3); n is an integer from 2 to 8, inclusive; and B is 1H-1,2,4-triazol-1-yl or a moiety of the formula:



wherein R is hydrogen, alkyl(C_1–C_3) or phenyl.

19. The method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal a thromboxane synthetase enzyme inhibiting amount of a compound of claim 1.

21. The method of inhibiting hypertension in a mammal which comprises administering to said mammal a hypotensive amount of a compound of claim 1.

4,576,958
ANTIHYPERTENSIVE 4,5-DIARYL-1H-IMIDAZOLE-2-METHANOL DERIVATIVES

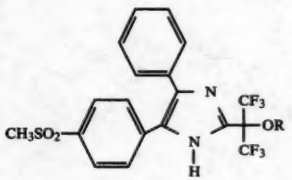
Ruth R. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 23, 1984, Ser. No. 573,214

Int. Cl.⁴ C07D *233/54;* **A61K** *31/415*

U.S. Cl. 514—400 **3 Claims**

1. A method of treating hypertension in a mammal comprising administering to the mammal an antihypertensive amount of a compound of the formula



where R is H or

or a pharmaceutically suitable salt thereof.

4,576,959
6-SUBSTITUTED-4-DIALKYLAMINOTETRAHYDROBENZ[c,d]INDOLES

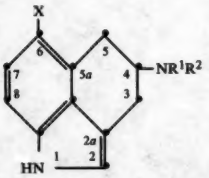
Michael E. Flaugh, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 577,096, Feb. 6, 1984. This application Feb. 1, 1985, Ser. No. 697,292

Int. Cl.⁴ A61K *31/40;* **C07D** *209/90*

U.S. Cl. 514—411 **23 Claims**

1. A 4-substitutedamino-6-substituted-1,3,4,5-tetrahydrobenz[c,d]indoles of the formula



wherein R^1 and R^2 are individually hydrogen, methyl, ethyl,

n-propyl or allyl; R^1 is additionally Y—CO where Y is H; CH_3; C_2H_5 or CH_2=CH; and X is a halogen, CN, $CONH_2$, NH_2 or NO_2, and pharmaceutically acceptable salts thereof.

2. A compound according to claim 1 in which X has its previous meaning and R^1 and R^2 are individually methyl, ethyl, n-propyl or allyl.

18. A method of treating depression which comprises administering to a depressed individual an antidepressant dose of a compound according to claim 2.

4,576,960

6,11-DIHYDRO-11-OXO-DIBENZ[b,e]OXEPIN DERIVATIVES

Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst Roussel Pharmaceuticals Incorporated, Somerville, N.J.

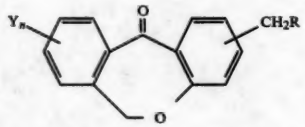
Continuation-in-part of Ser. No. 333,835, Dec. 23, 1981, Pat. No. 4,515,946. This application Apr. 4, 1983, Ser. No. 482,072

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

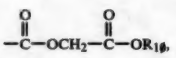
Int. Cl.[4] A61K *31/42, 31/335*

U.S. Cl. 514—450 **17 Claims**

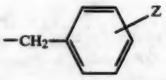
1. A 6,11-dihydro-11-oxo-bibenz[b,e]oxepin derivative having the formula



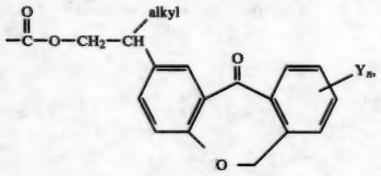
where Y is hydrogen, alkyl, alkoxy, halogen and trifluoromethyl; R is



where R_{10} is hydrogen, and

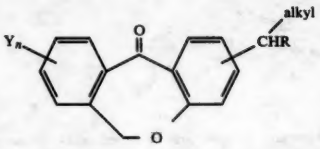


where Z is hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and amino; and

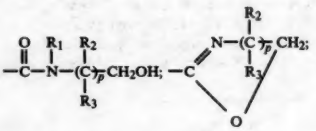


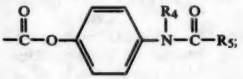
and where appropriate the optical isomers thereof and the racemic mixture thereof.

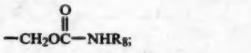
4. A 6,11-dihydrodibenz[b,e]oxepin acid derivative having the formula

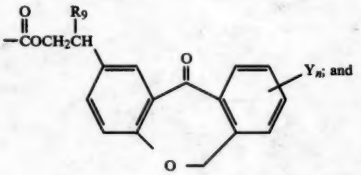


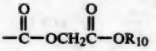
where Y is hydrogen, alkyl, alkoxy, halogen and trifluoromethyl; R is



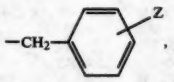






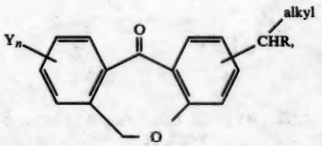


where R_{10} is hydrogen, alkyl, and

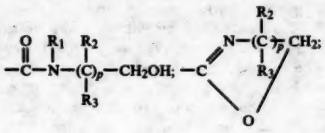


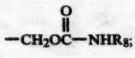
where Z is hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and amino; where n is 0, 1, 2 or 3; p is 1 or 2; q is 0, 1, or 2; R_1 to R_7 are the same or different and are hydrogen and alkyl and R_8 is hydrogen, alkyl and phenyl; R_9 is hydrogen and alkyl; the optical isomers thereof and the racemic mixture thereof and the pharmaceutically acceptable addition salts thereof.

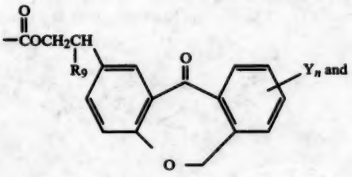
8. An antiinflammatory composition which comprises an effective antiinflammatory amount of a compound of the formula

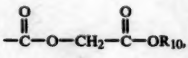


where Y is hydrogen, alkyl, alkoxy, halogen, and trifluoromethyl; R is

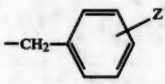






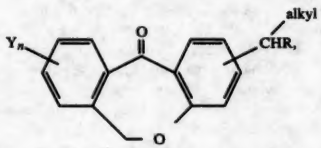


where R_{10} is hydrogen, alkyl and

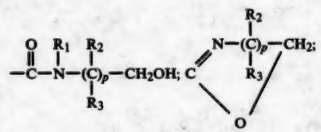


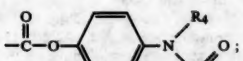
where Z is hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and amino; where n is 0, 1, 2 or 3; p is 1 or 2; q is 0, 1, or 2; R_1 to R_7 are the same or different and are hydrogen and lower alkyl and R_8 is hydrogen, lower alkyl and phenyl and R_9 is hydrogen and alkyl, or its optical isomers of the racemic mixture thereof.

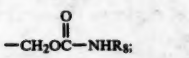
12. An analgesic composition which comprises an effective pain alleviating amount of a compound of the formula



where Y is hydrogen, alkyl, alkoxy, halogen and trifluoromethyl; R is







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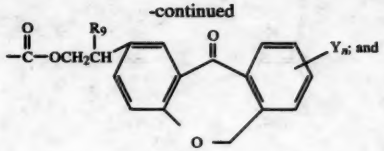
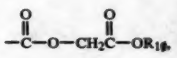
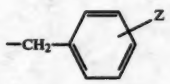


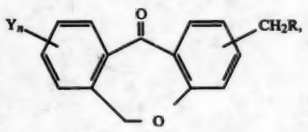


where R_{10} is hydrogen, alkyl and

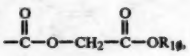


where Z is a hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and amino; where n is 0, 1, 2 or 3; p is 1 or 2; q is 0, 1, or 2; R_1 to R_7 are the same or different and are hydrogen and lower alkyl, R^8 is hydrogen, lower alkyl and phenyl and R_9 is hydrogen and alkyl and where appropriate the optical isomers thereof and the racemic mixtures thereof.

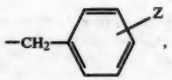
16. A method of alleviating inflammation in a mammal which comprises administering to a mammal an inflammation alleviating effective amount of a compound selected from the group consisting of (a) a compound of the formula



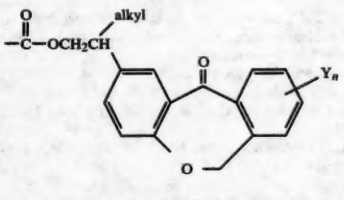
where Y is hydrogen, alkyl, alkoxy, halogen and trifluoromethyl; R is



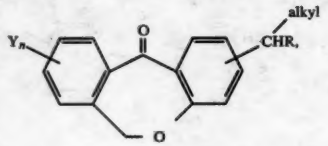
where R_{10} is hydrogen and



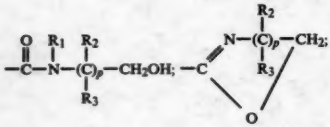
where Z is hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and

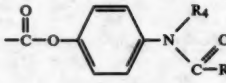


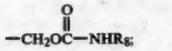
and where n is 0, 1, 2 or 3; and where appropriate the optical isomers thereof and the racemic mixture thereof; and (b) a compound of the formula

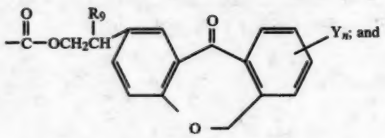


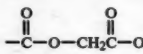
where Y is hydrogen, alkyl, alkoxy, halogen and trifluoromethyl; R is



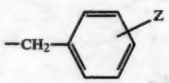








where R_{10} is hydrogen, alkyl and



where Z is hydrogen, alkyl, alkoxy, halogen, trifluoromethyl, nitro and amino; where n is 0, 1, 2, 3; p is 1 or 2; q is 0, 1, or 2; R_1 to R_7 are the same or different and are hydrogen and lower alkyl, R^8 is hydrogen, lower alkyl and phenyl and R_9 is hydrogen and alkyl, or its optical isomers or the racemic mixture thereof.

4,576,961

ANTIBIOTIC HETEROCYCLIC OXYGEN COMPOUNDS AND USE

Henning O. B. Lorck, No. 4, Rudemarken, DK-2840 Holte, and Poul R. Rasmussen, No. 7, Faellesvej, DK-3600 Frederikssund, both of Denmark

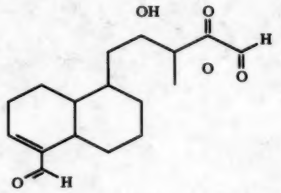
Continuation-in-part of Ser. No. 322,694, Nov. 18, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,812

Claims priority, application United Kingdom, Dec. 3, 1980, 8038772

Int. Cl.[4] A61K *31/335, 31/34;* **C07D** *303/32, 493/10*

U.S. Cl. 514—462 **8 Claims**

1. A complex of closely related compounds, this complex being designated PR-1350 and hemiacetals thereof with alcohols of the general formula ROH, R being represented by a straight or branched alkyl radical having from 1 to 8 carbon atoms, such alkyl radicals being optionally substituted with halogen atoms or hydroxy, alkyloxy, aralkyloxy, aryloxy, alkanoyloxy, aralkanoyloxy, aroyloxy, sulfhydryl, alkylthio, aralkylthio, arylthio, alkanoylthio, aroylthio, azido, nitro, cyano, thiocyano, hydroxycarbonyl, alkyloxycarbonyl, aryloxycarbonyl, amino, alkylamino, dialkylamino, arylamino, alkanoylamino, and aroylamino groups; R can further be an alkenyl or alkynyl radical having from 2 to 6 carbon atoms, a cycloalkyl radical having from 3 to 7 carbon atoms in the alicyclic ring, or the mono- or dihalo, lower alkyl, lower alkoxy or hydroxy substituted analogues, an aralkyl, heterocyclylalkyl or aryl radical, these radicals being optionally substituted with halogen, nitro, lower alkyl, hydroxy or alkoxy radicals, PR-1350 having the basic structure as shown in formula I



I

and the complex PR-1350 being characterized by the following physico-chemical properties:

1. IR-spectrum of PR-1350: as shown in FIG. 1;
2. Optical rotation of PR-1350, measured 4 hours after preparation of the solution: $[\alpha]_D^{20} = +85°-90°$ (c=1, ethanol);
3. Electron impact mass spectrum (m/e) or PR-1350: 366, 205, 204, 189, 187, 175, 161, 159, 149, 147, 145, 135, 133, 131, 121, 119, 109, 107, 105, 95, 93, 91, 81, 79, 77, 69, 67, 55, 44, 41;
4. ^{1}H-NMR spectrum (10% solution deuteroacetone) of PR-1350: 9.28 (s), 6.63 (bt), 2.41 (m), 1.77 (m), 1.21 (s), 0.96 (s);
5. ^{13}C-NMR spectrum (10% solution in deuterochloroform) of PR-1350: 193.8 (d), 151.9 (s), 151.5 (d), 44.1, 37.6, 36.3, 29.3, 28.6, 25.9, 21.6, 17.8, 15.8;
6. Ultraviolet absorption maximum at 230 nm ($E_{1\,cm}^{1\%} = 304$) of PR-1350 in ethanol solution;
7. Solubility of PR-1350: Soluble in ethyl acetate, ethyl ether, benzene, ethanol, methanol, and chloroform; relatively insoluble in water; and insoluble in saturated hydrocarbon solvents.

8. A therapeutic method for treating an infectious disease which comprises administering to a host in need of such treatment an effective amount of a complex according to claim 1.

4,576,962

PROSTAGLANDIN ANALOGUES

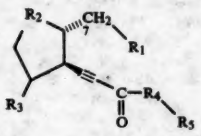
Randall S. Matthews, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 542,210, Oct. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 439,504, Nov. 5, 1982, abandoned. This application May 4, 1984, Ser. No. 607,351

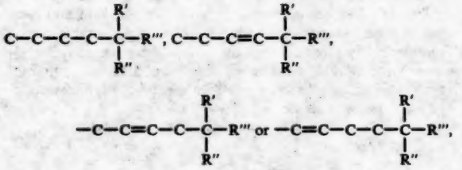
Int. Cl.[4] C07C *177/00;* **A61K** *31/557*

U.S. Cl. 514—530 **32 Claims**

1. The 13,14-didehydro-15-oxo-prostaglandin analogues of the formula:



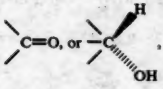
wherein R_1 is



wherein

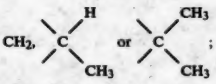
R′ and R″ are each independently H, CH_3, C_2H_5 or C_3H_7, and R‴ is CH_2OH, or $COOR_6$;

R_2 is



R_3 is hydrogen, hydroxyl, or hydroxymethyl, methylene, or R⁗—O—, wherein R⁗ is an alkyl having from 1 to 4 carbon atoms;

R_4 is



R_5 is C_2H_5; C_3H_7, C_4H_9 or C_5H_{11}; and

R_6 is

(a) hydrogen,
(b) alkyl or one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3, wherein (p—Ph) is para-phenyl or inter-paraphenylene,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_7, wherein R_7 is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmaceutically acceptable cation.

4,576,963

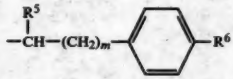
POLYPRENYL COMPOUNDS, PROCESS FOR THE PRODUCTION THEREOF AND MEDICINES CONTAINING SAME

Isao Yamatsu, Ushikumachi; Shinya Abe, Kukisakimura; Yuichi Inai, Tokyo; Takeshi Suzuki, Ushikumachi; Kensaku Kinoshita, Abiko; Mannen Mishima, Yatabemachi; Yoshinori Katoh, Misato; Seiichi Kobayashi, Tsuchiura; Manabu Murakami, Toyosatomachi, and Kouzi Yamada, Toride, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 396,184, Jul. 8, 1982, Pat. No. 4,455,316.
This application May 14, 1984, Ser. No. 609,664
Claims priority, application Japan, Jul. 23, 1981, 56-114371
Int. Cl.⁴ A61K *31/235*; C07C *69/612*
U.S. Cl. 514—532 6 Claims

1. A compound having the formula:

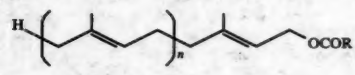
wherein R is a group having the formula:



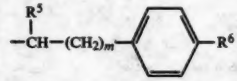
in which R^5 represents lower alkyl, R^6 represents lower alkyl, m represents the integer of 0 or 1, and n represents an integer of 2 or 3.

4. An anti-inflammatory composition containing, as an active ingredient, a therapeutically effective amount of a compound as claimed in claim 1, in combination with a pharmacologically acceptable carrier, diluent or vehicle.

6. A method for treating a patient suffering from rheumatism or arthritis which comprises administering to said patient a composition containing a therapeutically effective amount of compound having the formula:



wherein R is a group having the formula:



in which R^5 represents hydrogen or lower alkyl, R^6 represents lower alkyl, m represents an integer of 0 or 1 and n represents an integer of 1 to 3, in combination with a pharmacologically acceptable carrier, diluent or vehicle.

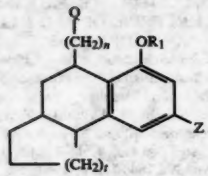
4,576,964

SUBSTITUTED HEXAHYDROBENZO[E]INDENE AND OCTAHYDROPHENANTHRENE CNS AGENTS AND PHARMACEUTICAL COMPOSITIONS THEREOF

James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 358,569, Mar. 16, 1982, Pat. No. 4,476,131.
This application Jun. 7, 1984, Ser. No. 618,151
Int. Cl.⁴ A61K *31/22*; C07C *43/10, 43/205*
U.S. Cl. 514—546 15 Claims

1. A compound having the formula



wherein n is zero, 1 or 2; t is 1 or 2, R_1 is H or (C_1–C_5)alkanoyl, Q is COR_5 or $C(OR^7)R_5R_6$, where R_5 and R_6 are each H, (C_1–C_4)alkyl, phenyl or benzyl; R_7 is H, or when one or both of R_5 and R_6 are H, R_7 is H or (C_2–C_4)alkanoyl;

Z is (C_5–C_{13})alkyl, (C_5–C_{13})alkoxy, (C_5–C_{13})alkoxyalkyl, (C_9–C_{14})phenylalkyl, (C_9–C_{14})phenylalkoxy or (C_9–C_{14})-phenylalkoxyalkyl.

13. A pharmaceutical composition suitable for use as an analgesic which comprises a pharmaceutically-acceptable carrier and an analgesia-effective amount of a compound according to claim 1.

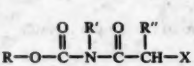
15. A pharmaceutical composition suitable for use in prevention and treatment of nausea which comprises a pharmaceutically-acceptable carrier and a compound according to claim 1 in an amount effective to prevent nausea.

4,576,965
PESTICIDAL OXIME N-ALKYL-N-α-HALOACYL-CARBAMATES

Themistocles D. J. D'Silva, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1983, Ser. No. 509,452
Int. Cl.[4] C07C *153/00*; A01N *37/52*
U.S. Cl. 514—564 14 Claims

1. Compounds having the structure:



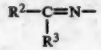
wherein:

R′ is C_{1-4} alkyl;

R″ is hydrogen or C_{1-4} alkyl;

X is chlorine, fluorine, or bromine; and

R is:



wherein:

R^2 is:

(a) C_{1-6} alkyl or C_{3-6} cycloalkyl, all of which may be unsubstituted or substituted with one or more halogen, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, amido, alkoximino, nitro or cyano groups, or

(b) alkoxycarbonyl, cyano, aminocarbonyl, alkylaminocarbonyl, or dialkylaminocarbonyl, provided that R may contain no more than six aliphatic carbon atoms; and

R^3 is hydrogen, C_{1-6} alkyl, cyano or alkoximinoalkyl.

4,576,966
TREATMENT OF MENTAL SYMPTOMS CAUSED BY ORGANIC DISORDER IN BRAIN

Shizuo Kuriyama, Ooi, and Mikio Saitoh, Ashiya, both of Japan, assignors to Eisai Co., Ltd. and Mitsubishi Chemical Industries Ltd., both of Tokyo, Japan

Continuation of Ser. No. 530,247, Sep. 8, 1983, Pat. No. 4,507,322. This application Aug. 3, 1984, Ser. No. 637,285
Claims priority, application Japan, Sep. 22, 1982, 57-165546
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—648 1 Claim

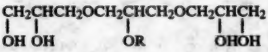
1. A method for improving and/or treating a patient afflicted with mental symptom caused by an organic disorder in the brain selected from the group consisting of head injury, brain surgery, brain abscess, spinal and cerebellar degenerative symptoms, amyotrophyic lateral sclerosis, multiple sclerosis, Parkinson's disease, chorea, athetosis, hemi-ballism and Wilson's disease, which comprises: administering to said patient a therapeutically effective amount of 2-(4-methylaminobutoxy)-diphenylmethane or a pharmaceutically acceptable salt thereof as an active ingredient, in combination with a pharmaceutically acceptable carrier.

4,576,967
NOVEL POLYOL ETHER COMPOUNDS, PROCESS PREPARING THE COMPOUNDS, AND COSMETICS COMPRISING SAME

Koichi Urata; Naotake Takaishi, both of Utsunomiya, and Yuji Suzuki, Tokyo, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,210
Claims priority, application Japan, Jul. 25, 1983, 58-135421
Int. Cl.[4] A61K *7/00*; C07C *43/10, 43/14*
U.S. Cl. 514—772 5 Claims

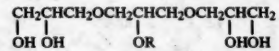
1. A polyol ether compound of the general formula (I)



(I)

in which R represents a saturated or unsaturated, linear or branched fatty hydrocarbon group having from 8 to 24 carbon atoms.

5. A cosmetic composition comprising an effective amount of a polyol ether compound of the general formula (I)



in which R is a saturated or unsaturated, linear or branched fatty hydrocarbon group having from 8 to 24 carbon atoms, and wherein said cosmetic composition is selected from the group consisting of cosmetic creams, emulsions, and lotions.

4,576,968
CATALYST COMPOSITION AND ITS USE IN A PROCESS FOR THE PRODUCTION OF ALCOHOLS FROM SYNTHESIS GAS

Barry Nay, Woking, and David G. Stewart, Epsom, both of England, assignors to The British Petroleum Company P.L.C., London, England

Division of Ser. No. 510,882, Jul. 5, 1983. This application Oct. 9, 1984, Ser. No. 659,017
Claims priority, application United Kingdom, Jul. 9, 1982, 8220083
Int. Cl.[4] C07C *27/06*
U.S. Cl. 518—713 6 Claims

1. A process for the production of alcohols which process comprises reacting carbon monoxide with hydrogen at elevated temperature and pressure in the presence as catalyst of a catalyst composition consisting essentially of:

(a) cobalt,
(b) one or more of copper, silver, gallium, zirconium, zinc and thorium,
(c) one or more of palladium, platinum and nickel, and
(d) one or more alkali metals, in the atomic ratio of component (a): component (b): component (c) of 100:1 to 400:1 to 500, the alkali metal or metals forming up to 5% by weight of the composition,

wherein the essential elements are present in the form of their oxides or in the form of salts which are decomposable by heat to oxides.

4,576,969

SPHERICAL ION EXCHANGE RESIN HAVING MATRIX-BOUND METAL HYDROXIDE, METHOD FOR PRODUCING THE SAME AND METHOD FOR ADSORPTION TREATMENT USING THE SAME

Yoshiaki Echigo; Yoshiyuki Suematsu, and Tadashi Ishikura, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Oct. 13, 1983, Ser. No. 541,646
Claims priority, application Japan, Oct. 13, 1982, 57-180469
Int. Cl.[4] C08D *5/20*; C08F *8/10*
U.S. Cl. 521—28 15 Claims

1. A spherical ion exchange resin, comprising:

a cross-linked phenolic resin; and

a water insoluble multivalent metal hydroxide, wherein said metal hydroxide is enclosed and bound by a matrix of the cross-linked phenolic resin.

4,576,970

PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES HAVING INTEGRAL SKIN

Otto Ganster, Leverkusen; Ulrich Knipp, Bergisch-Gladbach, and Bruno Luckas, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,844
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407931
Int. Cl.[4] C08G *18/14, 18/79*
U.S. Cl. 521—51 3 Claims

1. A process for the production of a molded article having a compact surface layer and a gross density above 900 kg/m^3 via the reaction injection molding technique, comprising introducing a reaction mixture into a closed mold, said reaction mixture comprising:

(a) a polyisocyanate component consisting of at least one polyisocyanate in which all the isocyanate groups are aromatically bound,
(b) compounds having molecular weights of from 400 to 12,000 and having at least two isocyanate reactive hydrogen atoms,
(c) water, in a quantity of at least 0.15 mol per mol of isocyanate groups of component (a), and
(d) optionally compounds having molecular weights of from 60 to 399 and having at least two isocyanate reactive hydrogen atoms,

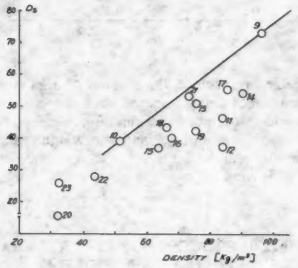
wherein the isocyanate index, based on all the reactants taking part in the reaction is from 70 to 125, maintaining a pressure of above 40 bar in the reaction mixture during the reaction so that the carbon dioxide formed in the course of the reaction remains completely or predominately in solution in the reaction mixture and in the molded article produced, and removing the resulting molded articles from the mold after termination of the chemical reaction.

4,576,971

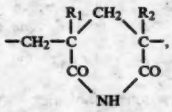
FLAME-RETARDED POLYACRYLAMIDE OR POLYMETHACRYLIMIDE SYNTHETIC RESIN FOAM

Ehrenfried Baumgartner, Darmstadt; Siegmund Besecke, Seeheim-Jugenheim, and Wolfgang Gaenzler, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

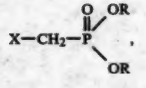
Filed Dec. 18, 1984, Ser. No. 683,042
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346060
Int. Cl.[4] C08J *9/06*
U.S. Cl. 521—108 11 Claims



1. A polyacrylimide or polymethacrylimide resin foam comprising (A) a polymer having 70 to 100 percent by weight of repeating units of the formula



wherein R_1 and R_2 are each hydrogen or methyl and 0–30 percent by weight of units of at least one other ethylenically unsaturated comonomer, and (B) at least 1 percent of phosphorus, by weight of the polymer, present at least partially in the form of an organophosphorus compound of the formula



wherein R are the same or different and are methyl, ethyl, or chloromethyl and X is hydrogen, halogen, hydroxyl, or RO—CO—.

4,576,972

CLOSED CELL PHENOLIC FOAM

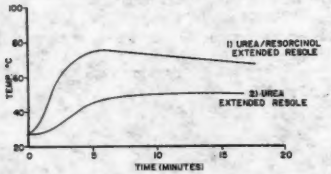
James Lunt, Brights Grove; Edwin J. MacPherson, and Paul J. Meunier, both of Sarnia, all of Canada, assignors to Fiberglas Canada, Inc., Ontario, Canada

Division of Ser. No. 676,262, Nov. 29, 1984, Pat. No. 4,546,119.
This application Jul. 29, 1985, Ser. No. 760,050
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—136 2 Claims

1. A phenolic foam material comprising the reaction product of:

(1) an aqueous solution of a base-catalyzed phenol-formaldehyde resole having a mole ratio of phenol to formaldehyde of between 1:3 and 1:4, said solution containing substantially no free phenol, the pH of said solution having been adjusted with carbon dioxide to between about 6

and 8 and the resulting precipitate having been removed, and having been concentrated to a viscosity of 30° C. of more than about 15,000 centipoises; and the pH having been adjusted by the addition of an acid to about pH 3 to 4;



(2) urea and resorcinol, the amount of urea and the amount of resorcinol being selected such that the mole ratio of urea and resorcinol to residual formaldehyde contained in said resole is about 1:1 and the weight ratio of urea to resorcinol is about 2:1 to 3:1 in the presence of a surfactant and a blowing agent.

4,576,973

COPOLYMER, PROCESS FOR ITS PREPARATION AND ITS USE AS A SORBENT

Karl-Heinz Keil, Hanau-Mittelbuchen; Fritz Engelhardt, Frankfurt; Ulrich Greiner, Schöneck; Klaus Kühlein, Kelkheim; Reinhold Keller, Bad Soden; Merten Schlingmann, Königstein, and Gerhard Hess, Altenstadt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,708

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324835

Int. Cl.⁴ C08J *9/00*

U.S. Cl. 521—149 **5 Claims**

1. Crosslinked, porous copolymer in the form of beads, containing 50 to 99.9% by weight of recurring units of a heterocyclic 5-membered ring compound which contains a polymerisable olefinic group and which has at least one protonisable nitrogen atom in the ring, or several such compounds, 0.1 to 50% by weight of units of a crosslinking agent or several such crosslinking agents, 0 to 25% by weight of units of a polymerisable organoboron and/or organosilicon compound or several such compounds and, relative to 100% by weight of the sum of the abovementioned units, 5 to 350% by weight of units of an N-vinylamide of the general formula I CH_2=CH—N(R-^{1})—C(R^2)=0 wherein R^1 denotes hydrogen, methyl or ethyl and R^2 denotes hydrogen or C_1—C_3-alkyl, or several such N-vinylamides and 0 to 40% by weight of units of another polymerisable compound or several such compounds.

4,576,974

POLYOL COMPOSITIONS AND POLYURETHANE FOAMS MANUFACTURED THEREFROM

William G. Carroll, Vossem, and Ian D. Rosbotham, Heverlee, both of Belgium, assignors to Imperial Chemical Industries, PLC, London, England

Filed Feb. 11, 1985, Ser. No. 700,385

Claims priority, application United Kingdom, Mar. 8, 1984, 8406050

Int. Cl.⁴ C08G *18/14, 18/34*

U.S. Cl. 521—173 **3 Claims**

1. A polyol composition comprising:

(A) a polyester polyol containing residues derived from succinic, glutaric and adipic acids having a hydroxyl number in the range 150 to 450 and from 0.5 to 2.0 branch points per 1000 units of molecular weight, and

(B) a non-polymeric or polyoxyalkylene polyol having a functionality of from 3 to 4 and a hydroxyl number of at least 750, the relative proportions of A and B being such that the composition has a hydroxyl number in the range 400 to 600.

4,576,975

WATER SOLUBLE MICHLER'S KETONE ANALOGS IN COMBINED PHOTOINITIATOR COMPOSITION AND POLYMERIZABLE COMPOSITION

Laurence W. Reilly, Jr., Yorktown Heights, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

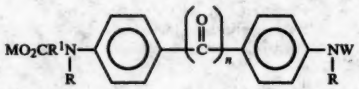
Division of Ser. No. 471,838, Mar. 3, 1983, Pat. No. 4,507,497. This application Dec. 18, 1984, Ser. No. 683,208

Int. Cl.⁴ C08F *2/50*; G03C *1/70*

U.S. Cl. 522—13 **5 Claims**

1. A photoinitiator system for a photopolymerizable composition having therein at least one addition-polymerizable compound containing ethylenic unsaturation, comprising:

(a) 0.1 to 10 weight percent of the total polymerizable composition of a compound which is a salt of a Michler's ketone analog and has the formula



wherein

R is an alkyl group of 1 to 8 carbon atoms,

R^1 is an alkyl group having 1 to 8 carbon atoms,

M is a cation,

W is R^1COOM or R^1H, and

n is an integer having a value of 1 or 2, and

(b) 0.1 to 10 weight percent of the total polymerizable composition of a free radical initiator compound selected from iodonium salts, biimidazoles, trialkylphosphites, alkyl peroxides, benzyl halides, alkyl nitrates, and the benzophenones other than (a).

4,576,976

PROCESS FOR THE PHOTOPOLYMERIZATION OF VINYL COMPOUNDS AND PHOTOPOLYMERIZABLE MATERIALS

Roland Schaefer, Friedrichsdorf, Fed. Rep. of Germany, assignor to Kulzer & Co., GmbH, Wehrheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 413,804, Sep. 1, 1982, Pat. No. 4,534,839. This application Mar. 7, 1984, Ser. No. 587,176

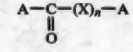
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136484

Int. Cl.⁴ C08F *2/50*

U.S. Cl. 522—16 **19 Claims**

1. In a process for the production of dental compositions by the photopolymerization of at least one vinyl monomer in the presence of a photoinitiator, the improvement comprising polymerizing said at least one vinyl monomer in the presence of a photoinitiator comprising:

(a) at least one photosensitizer of the formula



wherein

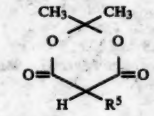
X is selected from the group consisting of CO, C(R^1)(R^2) and C(R^3)(OR^4), wherein R^1, R^2, R^3, R^4 are each selected from the group consisting of hydrogen and a hydrocarbon radical;

n is 0 or 1; and

A is selected from hydrocarbon radicals which may be substituted and which may be bonded together with the

proviso that when n is 1 and X is $C(R^1)(R^2)$, and when n is 0, A is an aromatic radical; and

(b) at least one reducing agent having the formula



wherein R^5 is selected from the group consisting of alkyl, substituted alkyl, aryl, substituted aryl, aralkyl and substituted aralkyl.

4,576,977

CURABLE RESIN COMPOSITION

Nobuyuki Miyazaki; Takashi Takayanagi, both of Yokohama, Japan, and Hiromichi Higaki, Irvington, N.Y., assignors to Asahi Glass Company Ltd., Tokyo, Japan

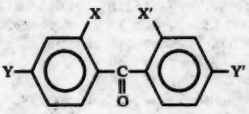
Filed Aug. 6, 1984, Ser. No. 637,833

Claims priority, application Japan, Aug. 9, 1983, 58-144358

Int. Cl.⁴ G21F *1/10*

U.S. Cl. 523—137 **14 Claims**

1. A curable resin composition comprising a cured matrix-forming component and an ultraviolet absorber, wherein said ultraviolet absorber comprises a benzophenone derivative represented by the formula (I):



(I)

where each of X and X' is a hydrogen atom or a hydroxyl group, provided that at least one of X and X' is a hydroxyl group, each of Y and Y' is a hydrogen, a hydroxyl group, —OROH or —OR', provided that at least one of Y and Y' is —OROH, where R is an alkylene group and R' is a monovalent organic group, and said cured matrix forming component is reactive with a hydroxyl group.

4,576,978

METHOD FOR PREPARING POLYMER SOLUTIONS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 466,737, Feb. 16, 1983, Pat. No. 4,508,858. This application Feb. 8, 1985, Ser. No. 699,759

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.⁴ C08L *33/26*

U.S. Cl. 523—313 **18 Claims**

1. A process for the preparation of aqueous polymer solutions for use in secondary or tertiary recovery of oil from a subterranean oil-bearing formation comprising:

forming a first volume of a first reaction mixture comprising a polymerizable substance and a polymerization initiator;

introducing the first volume of the first reaction mixture into a first reaction vessel having an inlet and an outlet;

repeating at regular predetermined intervals the formation of additional volumes of the first reaction mixture and sequentially introducing each additional volume into the first reaction vessel in a manner such that a substantially stable interface forms between each adjacent volume and substantially no mixing occurs between each volume;

controlling the rate of movement of each volume of the first reaction mixture in the first reaction vessel from the inlet to the outlet thereof in a manner such that, as each volume of the first reaction mixture is continuously moved through the reaction vessel, the extent of polymerization of the polymerizable substance in each volume differs from that of every other volume in the first reaction vessel and the polymerization of the polymerizable substance in each volume is essentially complete, forming a polymer solution, when each volume successively reaches the outlet of the first reaction vessel;

successively and continuously removing each volume of the polymer solution from the outlet of the first reaction vessel;

forming a second reaction mixture by continuously introducing a dilution water in an amount less than that which causes free water to substantially separate from the polymer solution and a modifying agent capable of reacting with the polymer in the solution into each volume of polymer solution;

continuously introducing the second reaction mixture into a second reaction vessel having an inlet and an outlet;

controlling the rate of movement of the second reaction mixture in the second reaction vessel from the inlet to the outlet thereof in a manner such that the reaction between the polymer and the modifying agent is essentially complete, forming a product solution, when the second reaction mixture reaches the outlet of the second reaction vessel;

continuously removing the product solution from the outlet of the second reaction vessel; and

diluting the product solution prior to injecting it via a well into the subterranean oil-bearing formation.

4,576,979

HEAT-CURABLE SURFACE-COATING AGENTS, AND THEIR USE

Eberhard Schupp, Schwetzingen; Werner Loch, Erpolzheim; Rolf Osterloh, Gruenstadt, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 547,094

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311516

Int. Cl.⁴ C08K *3/20*; C08L *63/02*

U.S. Cl. 523—404 **13 Claims**

1. A heat-curable surface-coating agent which contains, as a binder, a mixture of (A) one or more polyadducts, polycondensates or other polymers having an average molecular weight M_n of from 500 to 10,000 and, per molecule, on average two or more OH or primary or secondary amino groups, or two or more OH and primary or secondary amino groups, or two or more OH and primary and secondary amino groups, or two or more primary and secondary amino groups, with the proviso that component (A) is a reaction product of epoxy resins with alcohols, mercaptans or amines and (B) a reaction product of (a) one or more polyisocyanates, (b) one or more secondary monoamines and, (c) one or more polyalcohols having two or more hydroxy groups.

4,576,980

AZETIDINEDIONE COMPOUNDS AS CROSSLINKERS FOR ELECTRODEPOSITED COATINGS

Shenghong A. Dai, Wallingford, and Philip W. Sherwood, Milford, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 15, 1984, Ser. No. 660,768

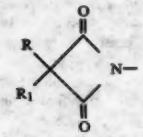
Int. Cl.⁴ C08K *3/20*

U.S. Cl. 523—420 **15 Claims**

1. A coating composition in aqueous dispersion for forming a heat-curable film on a substrate said composition comprising

1. a polymer having amine groups selected from the group consisting of primary amines, secondary amines, and mixtures thereof said amine groups being in the form of their acid salts; and

2. a crosslinking agent having at least two azetidinedione groups of the formula



wherein R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, said azetidinedione crosslinking agent being present in at least an equivalent amount to react with substantially all of said amine groups.

4,576,981

ADHESIVE COMPOSITION

Manfred Hilger, Konz; Günter Hultzsch, and Roman Kelper, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,684

Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315977

Int. Cl.[4] C08L *67/02, 27/08;* **C08J** *7/04, 5/18*

U.S. Cl. 524—40 **19 Claims**

1. An adhesive composition suitable for use on a polyester surface, consisting essentially of:

a copolyester, said copolyester comprising linear polyesters having molecular weights up to about 20,000 and being the reaction product of diols having from 2 to 8 carbon atoms; and dicarboxylic acids having from 4 to 12 carbon atoms; and

at least one copolymer of vinylidene chloride.

4,576,982

HYDROLYTICALLY STABILIZED POLYCARBONATES

John A. Tyrell, and Gary L. Freimiller, both of Mt. Vernon, Ind., assignors to General Motors Company, Mt. Vernon, Ind.

Filed Sep. 14, 1984, Ser. No. 650,427

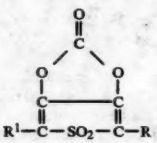
Int. Cl.[4] C08L *69/00*

U.S. Cl. 524—84 **26 Claims**

1. A thermoplastic composition exhibiting improved hydrolytic stability comprising, in physical admixture:

(i) at least one aromatic carbonate polymer; and

(ii) a hydrolytic stabilizing effective amount of at least one compound represented by the general formula



wherein R and R^1 are independently selected from hydrogen, monovalent hydrocarbon radicals, or monovalent hydrocarbonoxy radicals.

4,576,983

POLYMERIC COMPOSITION USEFUL FOR HOT WATER PIPE SERVICE

Ananda M. Chatterjee, Houston, and Earl E. Hayden, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 646,483, Aug. 31, 1984, abandoned, which is a continuation of Ser. No. 531,527, Sep. 12, 1983, abandoned. This application Mar. 27, 1985, Ser. No. 716,524

Int. Cl.[4] C08K *5/36*

U.S. Cl. 524—101 **6 Claims**

1. District heating pipes for potable water which contain a polymeric composition consisting essentially of an intimate blend of:

(a) about 93 to about 98 percent by weight of an isotactic butene-1 homopolymer;

(b) about 0.05 to about 0.5 percent by weight of 1,3,5-Tris(4-tert-butyl-3-hydroxy-2,6-dimethyl-benzyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione antioxidant;

(c) about 0.2 to about 0.7 percent by weight of lauryl-stearyl thiodipropionate;

(d) about 0.02 to about 0.6 percent by weight of a nucleating agent;

(e) about 0.5 to about 3.0 percent by weight of filler component comprising a mineral filler coated with an acid acceptor; and

(f) zero to about 3.0 percent by weight pigment.

4,576,984

STABILIZER COMPOSITIONS FOR PVC RESINS

Robert E. Bresser, Sharonville; Keith A. Mesch, and Karl R. Wursthorn, both of Cincinnati, all of Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

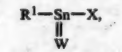
Continuation of Ser. No. 345,830, Feb. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 238,298, Feb. 26, 1981, abandoned. This application Jan. 10, 1984, Ser. No. 569,544

Int. Cl.[4] C08K *5/58*

U.S. Cl. 524—182 **5 Claims**

2. A composition for stabilizing halogen-containing organic polymers against the deteriorative effects of heat, said composition consisting essentially of the product produced by blending:

A. a mono-organotin compound or mixture of mono-organotin compounds selected from compounds having the formulas:



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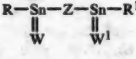

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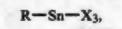

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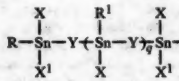

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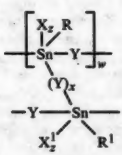
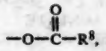


(V)

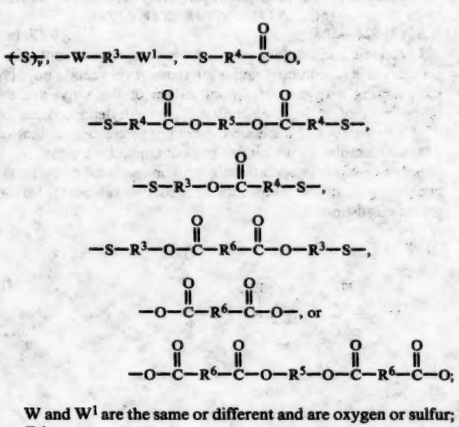
wherein

X and X^1 are the same or different and are selected from $-SR^2$,



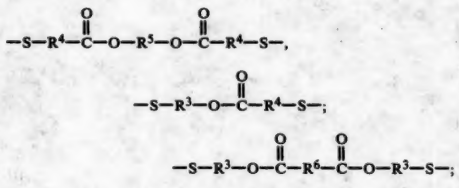
and O—R^8 with the proviso that in formula (V) when z=1 and in formulas (III) and (IV) at least one X or X^1 is —SR^2;

Y is

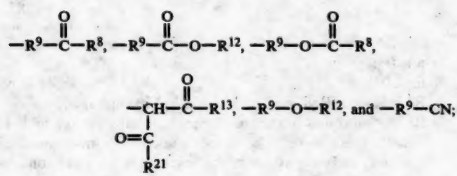


W and W^1 are the same or different and are oxygen or sulfur;

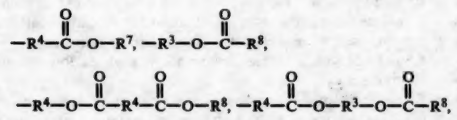
Z is



R and R^1 are the same or different and are selected from alkyl aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,



R^2 is alkyl, alkenyl, aryl, aralkyl, cycloalkyl, cycloalkenyl,



R^3 is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^4 is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^5 is R^3;

R^6 is nothing or R^4;

R^7 is —H or R^8;

R^8 is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;

R^9 is C_1 to C_4 alkylene;

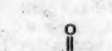
R^{12} is —H or a monovalent C_1 to $_{20}$ hydrocarbon radical;

R^{13} and R^{21} are the same or different and are each C_1 to C_{20} alkyl or C_1 to C_{20} alkoxy;

q=0 or an integer from 1 to 4 inclusive;

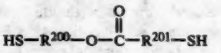
v=an integer from 1 to 8 inclusive; and

w=0, 1 or 2, x=0 or 1, z=0 or 1 with the proviso that when x=0 then z=1, when x=1 then z=0 and w=1, when w=2 then x=0 and z=1, and when w=0 then x=0, z=1 and Y is —W—R^3—W^1— or



and

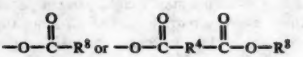
B. in a synergistically effective amount, a mercaptan-containing organic compounds selected from compounds having the formula:



(VIIIa)

where

R^{200} and R^{201} are the same or different and are alkylene, alkenylene, arylene, cycloalkylene or cycloalkenylene; or alkylene, alkenylene, arylene, cycloalkylene or cycloalkenylene each substituted with one or two —R, —O—R^7, —R^9—O—R^7,



groups; R, R^7, R^8, R^4 and R^9 are as defined in component A above.

4,576,985

HOT-MELT ADHESIVE

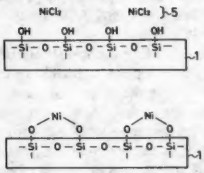
Yasuichi Ono, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,869

Claims priority, application Japan, Aug. 8, 1983, 58-143797

Int. Cl.⁴ C08K *3/10*; **C08L** *15/02, 33/10, 87/00*

U.S. Cl. 524—407 **9 Claims**



1. A hot melt adhesive suitable for bonding materials to an adherend surface which is characterized by the presence of hydrophilic silanol groups, said adhesive comprising from 5% to 65% by weight of a thermoplastic resin, from 25% to 65% by weight of a low boiling solvent substantially all of which will evaporate when the adhesive is held at a temperature of

from 120° C. to 200° C. for a sufficient period of time, and from 0.1% to 25% by weight of a metal salt which will react with said silanols to render said adherend surface hydrophilic.

4,576,986

RUBBER COMPOSITIONS CONTAINING SMALL PARTICLE SIZE ZEOLITES AND MIXTURES

John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 557,377, Dec. 1, 1983, and Ser. No. 572,122, Jan. 17, 1984, said Ser. No. 557,377, which is a continuation of Ser. No. 349,787, Feb. 18, 1982, abandoned, which is a continuation of Ser. No. 93,345, Nov. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,836, said Ser. No. 572,122, which is a continuation of Ser. No. 274,898, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 93,345, Ser. No. 88,243, Ser. No. 971,584, and Ser. No. 189,419, Sep. 22, 1980. This application Jun. 11, 1984, Ser. No. 619,504

Int. Cl.[4] C08K *3/10, 3/34;* C08L *7/00, 9/00*

U.S. Cl. 524—450 4 Claims

1. A rubber composition which contains as filler synthetic zeolitic filler particles said particles being selected to make a controlled combination of from 20–80 wt. % of a zeolite similar to Zeolite X and from 20–80 wt. % of a zeolite similar to Zeolite A, said particles being similar to zeolite X and zeolite A in having the chemical formula of zeolite X and zeolite A but differing from zeolite X and zeolite A in having larger ports or pore diameters, having bimodal pore size distribution, and having X-ray diffraction patterns depressed from those of zeolite X and zeolite A, said combination being formed when the preparative batch reaction mixture of sodium silicate and sodium aluminate has a water to sodium oxide molar ratio of between 10:1 and 60:1; a sodium oxide to silica molar ratio of between 0.5:1 and 3:1; and a silica to alumina molar ratio of between 2:1 and 15:1, wherein the particles of said combination exhibit a narrow differential weight percent gaussian distribution with an average particle size of no more than about 2.2 microns with at least 90 percent of the weight between 0.1 and 5.0 microns in diameter, wherein the cumulative percent population exhibits at least 41 percent by weight less than one micron, with no more than 5 percent by weight greater than 3.2 microns in diameter, said particles having a surface area of greater than 10 m^2/g.

4,576,987

AQUEOUS WATER-REPELLENT COATINGS

William B. Crockatt, Mississauga, and John Rimma, Scarborough, both of Canada, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 13, 1984, Ser. No. 681,207

Int. Cl.[4] C08K *5/01;* C08L *91/08*

U.S. Cl. 524—487 20 Claims

1. An aqueous coating composition containing a large proportion of wax which dries to provide a continuous and durable film from which the wax will slowly and progressively exude to the surface to provide a water repellent surface which confers long term water resistance comprising: (1) from 5% to 40% of an aqueous microcrystalline wax dispersion; (2) from 40% to 93% of an aqueous emulsion of copolymerized monoethylenically unsaturated monomers having a sufficiently low glass transition temperature to coalesce on air drying; and (3) from 1% to 20% of an N-methylol functional self crosslinking polyurethane aqueous dispersion in which the polyurethane contains sufficient volatile amine-neutralized carboxyl groups for water dispersibility, said proportions being by weight based on the solids content of the three components which are blended together.

4,576,988

SAPONIFIED PRODUCTS OF SILICON-CONTAINING ETHYLENE-VINYL ACETATE COPOLYMER AS MELT MOLDING MATERIALS

Yoshinari Tanaka; Akimasa Aoyama; Takeshi Moritani, all of Kurashiki; Kenji Satoh, Tondabayashi, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

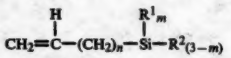
Filed Dec. 3, 1984, Ser. No. 677,200

Claims priority, application Japan, Dec. 19, 1983, 58-240759

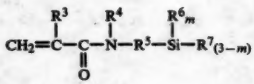
Int. Cl.[4] C08L *29/04;* C08F *8/00*

U.S. Cl. 524—503 7 Claims

1. A melt molding material which comprises a saponified product of a silicon-containing ethylene-vinyl acetate copolymer, having a degree of saponification of the vinyl acetate component of at least 95 molar %, an ethylene content of 25–55 molar % and a silicon-containing monomer content of 0.0005–0.2 molar % which has been obtained by saponifying a copolymer of vinyl acetate, ethylene and at least one silicon-containing olefinically unsaturated monomer selected from the group consisting of:

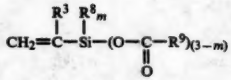


(I)



(II)

and



(III)

wherein

n is 0 or 1,

m is 0–2,

R^1 is lower alkyl, aryl or lower alkyl having aryl,

R^2 is a saturated branched or non-branched alkoxy of 1–40 carbon atoms or a saturated branched or non-branched alkoxy of 1–40 carbon atoms having a substituent containing oxygen,

R^3 is hydrogen or methyl,

R^4 is hydrogen or lower alkyl,

R^5 is alkylene of 1–5 carbon atoms or a divalent organic residue consisting of two chains of 1–5 carbon atoms connected with each other via oxygen or nitrogen,

R^6 is hydrogen, halogen, lower alkyl, aryl, or lower aryl having alkyl,

R^7 is alkoxy of 1–40 carbon atoms, acyloxy of 1–40 carbon atoms, alkoxy of 1–40 carbon atoms having a substituent containing oxygen or nitrogen, or acyloxy of 1–40 carbon atoms having a substituent containing oxygen or nitrogen,

R^8 is hydrogen, halogen, lower alkyl, aryl or lower alkyl having aryl, and

R^9 is lower alkyl.

4,576,989

AQUEOUS SOLUTIONS OR DISPERSIONS OF CATIONIC OLIGO-URETHANES, A PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF TO PRODUCE COATINGS

Klaus Noll, Cologne, Fed. Rep. of Germany; Terry Potter, New Martinsville, W. Va.; Josef Pedain, Cologne, and Jürgen Schwindt, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,710

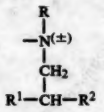
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3406998

Int. Cl.[4] C08L 75/04

U.S. Cl. 524—591 9 Claims

1. An aqueous solution or dispersion of cationic oligourethanes which are cross-linkable at elevated temperatures and which solutions or dispersions may contain blocked polyisocyanate groups wherein the oligourethanes contain

(a) about 0.1 to 3% by weight of ternary or quaternary ammonium ions in the form of structural units which are incorporated via urethane groups terminally and/or within the oligourethane, corresponding to the formula



wherein

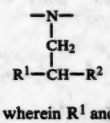
R represents hydrogen or an aliphatic, cycloaliphatic or araliphatic radical obtained by quaternizing tert. nitrogen atoms with an alkylating, cycloalkylating or aralkylating agent,

R^1 represents hydrogen or an alkyl radical having from 1 to 4 carbon atoms,

R^2 represents —C≡N, —CO—NH_2, —CO—NHR^3, —CO—NR_2^3 or —$COOR^3$,

R^3 represents a monovalent hydrocarbon radical which may have inert substituents,

(b) up to about 2.8% by weight of tert. amine nitrogens in the form of structural units which are incorporated via urethane groups terminally and/or within the molecule, corresponding to the formula



wherein R^1 and R^2 are as defined above and

(c) about 0 to 15% by weight of blocked isocyanate groups provided that the ternary ammonium groups of (a), the tert. nitrogen atoms of (b) and the blocked isocyanate groups both incorporated into the oligourethane and being a part of the blocked polyisocyanate optionally present in the solution or dispersion are present in an equivalent ratio of (a+b):blocked isocyanate groups of about 1:1 to 1:1.5.

4,576,990

WATER-SOLUBLE INSULATING VARNISH

Shiro Mazaki, and Hiroshi Shibata, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1984, Ser. No. 671,841

Int. Cl.[4] C08L 77/00, 79/00

U.S. Cl. 524—602 14 Claims

1. A water-soluble insulating varnish which is prepared by reacting an aromatic dicarboxylic acid component and a polyhydric alcohol component containing at least 30 mol% of an alcohol having 3 or more hydroxy groups in the amounts such that the ratio of the hydroxyl group to the carboxyl group is from 1.2:1 to 1.8:1 to produce a high molecular weight polyester resin;

addition reacting a polybasic acid containing a single anhydride group in the molecule with the polyester resin to obtain a carboxyl group-containing polyester resin; and

dissolving the carboxyl group-containing polyester resin in water using a basic compound.

4,576,991

UV-RESISTANT FLAME RETARDANT COMPOSITIONS OF POLYCARBONATES AND HALOGENATED ALKENYL AROMATIC COPOLYMERS

Glenn D. Cooper, deceased, late of Delmar, N.Y. (by Rose Cooper, executrix), and Sai-Pei Ting, Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 25, 1984, Ser. No. 623,951

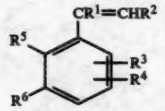
Int. Cl.[4] C08L 69/00

U.S. Cl. 525—146 11 Claims

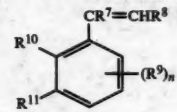
1. A flame retardant thermoplastic composition, comprising:

(a) an aromatic polycarbonate consisting essentially of a tetraalkyl-substituted aromatic polycarbonate; and

(b) a copolymer consisting of units of a non-halogenated alkenyl aromatic compound having the formula



wherein R^1, R^2, R^3, R^4, R^5 and R^6 selected from the group consisting of hydrogen and lower alkyl groups having from 1 to 6 carbon atoms; and units of a brominated alkenyl aromatic compound having the formula



wherein R^7 and R^8 are selected from the group consisting of hydrogen and lower alkyl groups having from 1 to 6 carbon atoms, R^9 is bromine and, R^{10}, R^{11} are selected from the group consisting of hydrogen, bromine and lower alkyl groups having from 1 to 6 carbon atoms, and n represents the number of R^9 substituents on the ring.

4,576,992

POLYMER MIXTURES

Hartmuth Buding, Dormagen; Heinrich Königshofen, Bergisch-Gladbach; Zsolt Szentivanyi, and Joachim Thörmer, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,486

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345249

Int. Cl.[4] C08L 45/00, 23/16

U.S. Cl. 525—211 4 Claims

1. Mixtures comprising (a) from 35 to 5%, by weight, of substantially saturated hydrocarbon elastomers selected from EPM, EPDM, butyl rubber or polyoctenamer; (b) from 65 to 95%, by weight, of a nitrile group-containing elastomer having from 25 to 140 nitrile nitrogen atoms and less than 12 double bonds per 1000 carbon atoms; and also (c) conventional mixture additives; the percentages being based on the sum of (a) and (b).

4,576,993

LOW DENSITY POLYETHYLENE POLYMERIC COMPOSITIONS

Paul Tamplin, and Malcolm D. Heaven, both of Swindon, Great Britain, assignors to Raychem Limited, England

Continuation of Ser. No. 237,508, Feb. 23, 1981, abandoned, which is a continuation of Ser. No. 26,950, Apr. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 25,120, Mar. 29, 1979, abandoned. This application Jan. 30, 1984, Ser. No. 574,943

Claims priority, application United Kingdom, Sep. 20, 1978, 37468/78

Int. Cl.[4] C08L *23/04*

U.S. Cl. 525—240 40 Claims

1. A substantially cross-linked polymeric composition comprising a first linear low density ethylene homo- or copolymer which, prior to cross-linking is characterized by (a) a density at 25° C. of less than 0.930 gm/cm^3, (b) a linearity expressed in terms of pendant methyl groups per 10^3 carbon atoms of the polymer chain of less than 30, (c) no more than 5 branches greater in length than C_8, and (d) a stress exponent in the range of from 1.2 to 1.4, wherein the first ethylene homo- or copolymer is present in the form of a blend with a blendable branched, ethylene homo- or copolymer, the polymers having been blended prior to cross-linking.

4,576,994

PROCESS FOR THE PREPARATION OF A POLYPROPYLENE MOLDING COMPOSITION

Bernhard Dorrer, and Helmut Strametz, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,583

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331877

Int. Cl.[4] C08F *297/08*

U.S. Cl. 525—247 2 Claims

1. A process for the preparation of a polypropylene molding composition consisting of 65 to 95% by weight of a polypropylene and 35 to 5% by weight of an ethylene propylene copolymer by continuous polymerization in two stages in liquid propylene, which comprises preparing a crystalline polypropylene or a polypropylene modified by small amounts of another 1-olefin in the first state at a temperature between about 40° C. and about 85° C. and a pressure higher than the pressure of the second stage and a residence time of 40 to 90 minutes and preparing an ethylene/propylene copolymer in the second stage at a temperature between about 40° C. and about 85° C. and under a pressure of 23 to 64 atmospheres and a residence time of 10 to 90 minutes in the presence of 10 to 55 mole % of ethylene, based on the ethylene/propylene mixture present, a mixed catalyst which has been formed by bringing into contact

(A) the reaction product of

(a1) a reaction product of a magnesium halide with an electron donor and/or a cyclopolyene and

(a21) a compound formed by reduction of titanium tetrachloride by means of an organometallic compound of main groups I to III of the periodic table or

(a22) titanium tetrachloride with

(B) a halogen-free organoaluminum compound and

(C) a compound from the group comprising cyclopolyenes and aromatic carboxylic acid esters, wherein the mixed catalyst being used in both stages is composed of about 0.001 to 1 mole/liter of liquid of component (A) about 0.01 to 40 moles/liter of liquid of component (B) and 0.003 to 12 moles/liter of liquid of component (C).

4,576,995

LAMINATED ARTICLE AND PRODUCTION THEREOF

Masamitsu Nakabayashi, Sennan; Yuzo Furukawa, Kawanishi, and Akira Tashiro, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Filed Jul. 19, 1984, Ser. No. 633,426

Claims priority, application Japan, Jul. 22, 1983, 58-134649

Int. Cl.[4] C08F *263/04*

U.S. Cl. 525—285 5 Claims

1. An adhesive for bonding an ethylene/vinyl alcohol copolymer and polystyrene together, which comprises a modified ethylene/vinyl acetate copolymer obtained by graft-copolymerizing styrene and an α,β-unsaturated dicarboxylic acid or anhydride thereof to an ethylene/vinyl acetate copolymer.

4,576,996

POLYCARBONATES EXHIBITING IMPROVED HEAT RESISTANCE

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 451,109, Dec. 17, 1983, Pat. No. 4,520,187. This application Mar. 1, 1985, Ser. No. 707,431

Int. Cl.[4] C08G *63/62, 63/64*

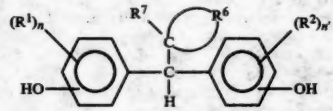
U.S. Cl. 525—439 54 Claims

1. Thermoplastic polymeric compositions exhibiting improved heat resistance comprised of

(i) at least one thermoplastic polymer containing the reaction products of:

(a) a carbonate precursor; and

(b) at least one dihydric phenol selected from dihydric phenols represented by the general formula



wherein:

each R^1 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals;

each R^2 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals;

R^6 is selected from divalent hydrocarbon radicals which together with the carbon atom to which R^6 is bonded form a cyclic structure;

R^7 is selected from hydrogen and monovalent hydrocarbon radicals; and

n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,576,997

ADHESIVE BLENDS

Jimmy R. Trotter, and Richard L. McConnell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,471

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—444 6 Claims

1. Composition comprising a blend of about 5–95% by weight of a copolyester selected from (a), (b), or mixtures thereof with about 95–5% by weight of (c) which are defined as follows:

(a) a crystallizable copolyester having a melting point of about 100°–190° C, a heat of fusion of less than 10 calories per gram and an I.V. of about 0.4–1.6, the copolyester being derived from an acid component of at least 50 mole

% terephthalic acid and a glycol component selected from the roup consisting of 1,4-butanediol, 1,6-hexanediol and combinations thereof, the copolyester also being derived from about 20–50 mole % of a co-acid or about 20–60 mole % of a co-glycol, or about 20–75 mole % of a combination of a co-acid and a co-glycol, the co-acid and co-glycol being selected from the group consisting of isophthalic acid, C_3–C_{12} aliphatic dibasic acids, aliphatic and cycloaliphatic glycols having 2–8 carbon atoms and diethylene glycol, the total of the acid component and the glycol component each being 100 mole %;

(b) a substantially amorphous copolyester having a glass transition temperature of 50° C. or higher, a heat of fusion of less than 1 calorie per gram and an I.V. of about 0.4–1.2, the copolyesters being derived from at least one acid selected from the group consisting of terephthalic acid, isophthalic acid, and 1,4-cyclohexanedecarboxylic acid, and at least one glycol selected from the group consisting of ethylene glycol, diethylene gglycol, and 1,4-cyclohexanedimethanol, with the proviso that the copolyester contains at least two acids or at least two glycols, the second acid or glycol being present in an amount of about 25–60 mole %; and

(c) a highly crystalline aliphatic homo- or copolyester having a melting point of about 40°–90° C. an I.V. of about 0.4–1.5 and a heat of fusion of greater than 10 cal/g., said homo- or copolyester essentially being derived from at least one aliphatic dibasic acid having 4 to 12 carbon atoms and at least one aliphatic glycol having 2 to 8 carbon atoms.

4,576,998

VINYL URETHANE COMPOSITE POLYMER CONTAINING VINYL TERMINATED URETHANE OLIGOMERS

Gilbert B. Ellerbe, III, and Robert E. Hefner, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1984, Ser. No. 679,440

Int. Cl.[4] C08G *18/62, 18/63;* **C08F** *283/04*

U.S. Cl. 525—455 **12 Claims**

1. A vinyl urethane composite polymer comprising the reaction product of a reaction mixture comprising

(a) from about 1 to about 20 percent by weight of the mixture of a vinyl-terminated urethane oligomer containing at least one segment derived from a poly(alkylene oxide) polyol having an equivalent weight of about 200–4000,

(b) from about 15 to 75 percent by weight of the mixture of a vinyl monomer having a boiling point above the temperature incurred in reacting said reaction mixture,

(c) a polyisocyanate in an amount sufficient to provide to the mixture from about 0.9 to about 1.5 isocyanate groups per active hydrogen atom contained therein, and

(d) a polyahl, provided that when said polyahl comprises a polymer polyahl containing dispersed soft polymer particles, the combined weight of said dispersed soft polymer particles and said vinyl-terminated oligomer is from about 1 to about 20 percent by weight of the mixture, and the vinyl-terminated urethane oligomer comprises about 5 to about 90 percent of the combined weight of the vinyl-terminated urethane oligomer and the dispersed soft polymer particles.

4,576,999

ULTRAVIOLET RADIATION-CURABLE SILICONE RELEASE COMPOSITIONS WITH EPOXY AND/OR ACRYLIC FUNCTIONALITY

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 6, 1982, Ser. No. 375,676

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—476 **8 Claims**

1. A process for preparing an organopolysiloxane having epoxy functionality and curable to an abhesive composition on exposure to ultraviolet radiation in the presence of a photoinitiator comprising the steps:

(1) Reacting a cyclic diolefin with a hydrogen-functional siloxane compound in the presence of a small amount of a precious metal catalyst;

(2) recovering a cyclic mono-olefin-substituted siloxane and reacting it with an epoxidation agent; and

(3) recovering an epoxy-functional polysiloxane.

4,577,000

CHEMICALLY STABLE STIFF BACKBONE POLYMERS AS MOBILITY CONTROL AGENTS IN OIL RECOVERY

Catherine S. H. Chen, Berkeley Heights, and Albert L. Williams, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,590

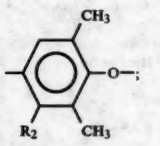
Int. Cl.[4] C08G *65/48, 75/20, 75/23*

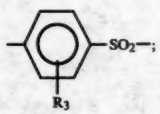
U.S. Cl. 525—534 **11 Claims**

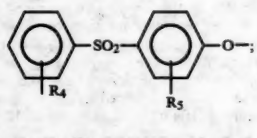
1. A water soluble polymer of the formula

$$H—R_1—H \qquad (I)$$

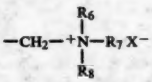
wherein R_1 is a stiff polymeric backbone consisting essentially of repeating units selected from the group consisting of


(II)


(III)

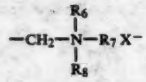

(IV)

where R_2, R_3, R_4 and R_5 comprise hydrogen and moieties of the formula



where X is halogen and R_6, R_7 and R_8 are the same or different and are C_1–C_{20} hydrocarbyl groups, provided that R_8 is absent when the moiety

forms a pyridyl ring, further provided that said



moieties are present in an amount sufficient to solubilize said polymer (I), said polymer (I) being water insoluble if all of R_2, R_3, R_4 and R_5 were hydrogen.

4,577,001

POLYMERIZATION OF OLEFINS EMPLOYING A CATALYST CONTAINING A TITANIUM COMPONENT DERIVED FROM HYDROXYALKYL AROMATIC COMPOUNDS

William M. Coleman, III, Lake Jackson, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 566,107, Dec. 27, 1983, Pat. No. 4,528,339. This application Nov. 13, 1984, Ser. No. 670,524

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

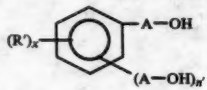
Int. Cl.[4] C08F 4/44; B01J 37/00

U.S. Cl. 526—127 **24 Claims**

1. In a process for polymerizing at least one α-olefin or a mixture of at least one α-olefin and at least one polymerizable ethylenically unsaturated monomer in the presence of a supported Ziegler-Natta catalyst; the improvement which comprises employing as the transition metal component of such catalyst that which results from reacting

(A) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen and x has a value from zero to 4; with

(B) at least one compound containing at least one aliphatic hydroxyl group represented by the formula



wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; R′ is independently hydrogen, a halogen atom, a hydrocarbyl group, a hydrocarbyloxy group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyl group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyloxy group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; n′ has a value of from 1 to 5, and each x independently has a value of from zero to 4; and wherein components (A) and (B) are employed in quantities which provide a molar ratio of (B):(A) of 0.1:1 to about 10:1.

4,577,002

ELASTOMERIC COPOLYMERS, THEIR PREPARATION AND THEIR USE

Antonius A. Broekhuis, Badhuisweg 3, 1031 CM Amsterdam, Netherlands

Continuation of Ser. No. 617,029, Jun. 4, 1984, abandoned. This application May 15, 1985, Ser. No. 734,260

Claims priority, application United Kingdom, Jun. 13, 1983, 8316052

Int. Cl.[4] C08F 4/48

U.S. Cl. 526—181 **11 Claims**

1. A process for preparing an elastomeric copolymer of an aromatic vinyl compound and a conjugated diene in the presence of an organolithium initiator characterized in that the process employs etheylene glycol n-butyl tert-butyl ether as a structural modifier to produce a copolymer which has a vinyl content of at least 30% by weight and a differential content of the aromatic vinyl compound at the ends of the copolymer which changes in a portion of not more than 5% of the polymer chain (as determined by monomer conversion) from a first value to a second value which is at least 25% points higher than the first value, and said portion lies with the initial 10% of the copolymer chain (as determined by monomer conversion) and on completion of polymerization, polymer chains are coupled by means of a coupling agent.

4,577,003

PENTACOORDINATE SILYL ENOLATES AND THEIR USE AS POLYMERIZATION INITIATORS

William B. Farnham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 619,944, Jun. 12, 1984, Pat. No. 4,528,389. This application Mar. 27, 1985, Ser. No. 716,481

Int. Cl.[4] C08F 2/00

U.S. Cl. 526—194 **6 Claims**

1. Process for polymerizing the monomer of the formula $CH_2{=}C(CH_3)X$ wherein

X is —C(O)X′ or;

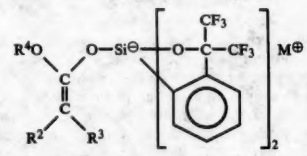
X′ is $-OSi(R^1)_3$, —OR or —NR′R″;

each R^1, independently, is H or a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms; provided, however, at least one R^1 is not H;

R is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms, optionally containing one or more ether oxygen atoms within aliphatic segments thereof, and optionally containing one or more functional substituents that are unreactive under polymerizing conditions; and

each of R′ and R″ is independently selected from C_{1-4} alkyl,

the process comprising contacting monomer, in an inert, anhydrous liquid medium, at a temperature in the range about 20° C. to about 120° C., with the pentacoordinate silyl enolate initiator of the formula



wherein

each of R^2 and R^3 is independently selected from H or C_{1-5} alkyl; provided, however, both R^2 and R^3 are not H;

R^4 is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms, optionally containing one or more ether oxygen atoms within aliphatic segments thereof; and

M is lithium, sodium, potassium or cesium.

4,577,004

PROCESS FOR PRODUCING A CHLOROPRENE POLYMER

Noriaki Emura; Takashi Ariyoshi, and Toshikazu Kato, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Dec. 14, 1984, Ser. No. 681,736

Claims priority, application Japan, Dec. 15, 1983, 58-235047

Int. Cl.[4] C07C 107/08; C09B 29/20

U.S. Cl. 526—204 **13 Claims**

1. A process for producing a chloroprene polymer, comprising

subjecting chloroprene to aqueous emulsion polymerization in the presence of a cyclic polysulfide compound which is present in a quantity equal to at least 0.1% by weight of

the weight of said chloroprene to form a chloroprene polymer, and

deflocculating said polymer.

4,577,005

POLYMERIC DIELECTRIC MATERIAL

Junichi Sako, Osaka; Toshiharu Yagi, Hyogo; Yoshihide Higashihata, Osaka; Masayoshi Tatemoto, Osaka; Nobuyuki Tomihashi, Osaka, and Yoshiki Shimizu, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 12, 1984, Ser. No. 620,006

Claims priority, application Japan, Jun. 20, 1983, 58-111702

Int. Cl.[4] C08F *214/22*

U.S. Cl. 526—254 6 Claims

1. A polymeric dielectric material film comprising a terpolymer which comprises 35 to 80% by mole of vinylidene fluoride, 15 to 60% by mole of trifluoroethylene and 0.5 to 11.2% by mole of hexafluoropropylene, said film having a permittivity of at least about 9.8 such that the permittivity is increased by 3 to 7 when said film is heated at a temperature of from 60° to 140° C. for at least one hour.

4,577,006

DICYCLOPENTADIENE RESINS

Samuel D. Hollis, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 15, 1985, Ser. No. 712,207

Int. Cl.[4] C08F *232/08*

U.S. Cl. 526—283 3 Claims

1. The synthetic polymeric resin obtained upon polymerization of a mixture, which comprises;

(a) dicyclopentadiene; and

(b) an aliphatic, conjugated hydrocarbon polyene having 8 to 12 carbon atoms, inclusive.

4,577,007

POLYMERS CONTAINING RESORCINOL MONOBENZOATE

Michael DeBergalis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 469,689, Feb. 25, 1983, Pat. No. 4,522,971.

This application Dec. 21, 1984, Ser. No. 684,938

Int. Cl.[4] C08F *22/10*

U.S. Cl. 526—321 6 Claims

1. A process of making a polymer of a moiety reacted with resorcinol monobenzoate, said moiety having a functional group which bonds to the hydroxyl group on the resorcinol monobenzoate through a linking group, said linking group including at least one group selected from the group consisting of ether, carbonate, and urethane groups and ester groups containing at least two carbon atoms, wherein the polymer contains by weight about 12.5–80% resorcinol monobenzoate, the balance being said moiety, said functional group being a group other than an isocyanate or a polymeric acyl halide,

wherein the monomer precursors of the polymeric moiety are reacted with resorcinol monobenzoate or a monomeric derivative containing resorcinol monobenzoate to produce a comonomer which is then copolymerized.

4,577,008

PROCESS FOR THE PRODUCTION OF ACRYLONITRILE-PROPYLENE COPOLYMERS

Kenneth C. Benton, Macedonia, and James L. O'Kane, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 27, 1984, Ser. No. 625,168

Int. Cl.[4] C08F *220/44, 2/18, 2/22*

U.S. Cl. 526—342 18 Claims

1. A thermoplastic polymeric composition resulting from the polymerization of

(A) a major portion of olefinically unsaturated nitrile monomers, and

(B) a minor portion of propylene

wherein the polymeric composition is a random copolymer comprising between 65 and 95 percent by weight of the polymerized olefinically unsaturated nitrile.

4,577,009

POLYIMIDE PRODUCT FROM PHENANTHRENE

Joseph G. Robinson, Winchcombe, and Pierce W. F. Riemer Huntly, both of England, assignors to Coal Industry (Patents) Limited, London, England

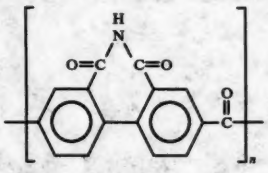
Filed Sep. 18, 1984, Ser. No. 651,713

Claims priority, application United Kingdom, Nov. 18, 1983, 8330793

Int. Cl.[4] C08G *10/04*

U.S. Cl. 528—228 2 Claims

1. A polyimide product of the general formula



where n is a value in the range 2 to 20.

4,577,010

PROCESS FOR THE PURIFICATION OF POLYPHENYLENE ETHERS

Nicola Bottazzini, Milan, and Marino Quaglino, Trecate, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 7, 1985, Ser. No. 689,093

Claims priority, application Italy, Jan. 9, 1984, 19075 A/84

Int. Cl.[4] C08G *65/46*

U.S. Cl. 528—487 5 Claims

1. A process for the purification of polyphenylene ethers, prepared by oxidative polycondensation of alkylphenols by means of copperamine catalysts consisting in treating a solution of the polymer, in an acid medium, with at least one compound comprised in the general formula

$$R—(SH)_n \qquad (I)$$

wherein:

n=a whole number ranging between 1 and 6, extremes included:

R may be:

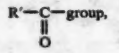
(a) a linear or branched alkyl radical containing from 1 to 16 carbon atoms, which can contain, as substituents in the chain, alkoxy groups having 1–6 carbon atoms, aminic, sulphonic, hydroxy, carboxylic groups, halogens, nitro (—NO_2) groups, sulphydrylic (—SH) groups in such number as to maintain the value of n no higher than 6;

(b) an aryl, alkylaryl, aralkyl, heterocyclic, cycloalkyl radical, containing altogether from 6 to 16 carbon atoms, optionally comprising substituent groups selected from alkyl groups having 1–6 carbon atoms, alkoxy groups having 1–6 carbon atoms, aminic, hydroxy, sulphonic, carboxylic, nitro groups, halogens and sulphydrylic groups, in such number that the value of n does not exceed limit 6;

(c) a hydrocarbon radical containing two or more non-condensed benzene rings, optionally containing in the benzene rings substituent groups selected from halogens, aminic, sulphonic, hydroxyl, carboxylic, nitro groups, C_1–C_6 alkyl and/or alkoxy groups and sulphyd-

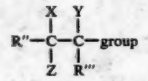
rylic groups in such number that n does not exceed value 6;

(d) an



wherein R' may be linear or branched alkyl radical containing from 1 to 16 carbon atoms, optionally containing in the chain, aminic hydroxyl, sulphonic, nitric, carboxylic, halogen substituent groups, sulphydrylic groups in such number that n does not exceed value 6; or R' may be an aryl, alkylaryl, aralkyl, cycloalkyl, or heterocyclic radical containing altogether from 6 to 16 carbon atoms, which may optionally contain substituents selected from alkyl and alkoxy groups having 1–6 carbon atoms, halogen atoms, sulphonic, carboxylic, hydroxy, aminic, nitric groups and sulphydrylic groups in such number that n does not exceed value 6;

(e) an



wherein R''=hydroxy group, R''', X, Y, Z, equal to or different from each other, may represent hydrogen, alkyl and/or alkoxy radicals having from 1 to 12 carbon atoms, sulphydrylic, aryl, arylalkyl, alkylaryl, cycloalkyl, heterocyclic groups, containing altogether from 1 to 16 carbon atoms.

4,577,011

MITICIDAL 2-(2-ALKYL-2,3-DIHYDROBENZOFURAN-7-YL)-N-ALKOXY-N-ALKYL-DIAZENECARBOXAMIDES

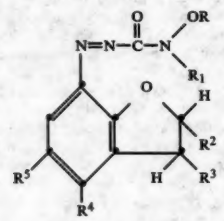
Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1984, Ser. No. 643,330

Int. Cl.[4] **C07C** *107/00, 113/04;* **A01N** *9/28;* **C07D** *307/78*

U.S. Cl. 534—787 **3 Claims**

1. A compound of the formula



wherein R, R^1 and R^2 each is alkyl of one to three carbon atoms; R^3 is hydrogen or alkyl of one to three carbon atoms; R^4 and R^5 each is hydrogen, bromine, chlorine, or alkyl of one to three carbon atoms.

4,577,012

METHOD OF SEPARATION OF NUCLEOTIDES AND NUCLEOSIDES FROM EACH OTHER

Masaaki Tsurushima, Minoo; Gozi Kokubu, Kitakatsuragi, and Koji Moriya, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 2, 1983, Ser. No. 557,367

Claims priority, application Japan, Dec. 3, 1982, 57-212971

Int. Cl.[4] **C07H** *17/00, 15/12, 19/06*

U.S. Cl. 536—24 **11 Claims**

1. A method for the separation of nucleotides and nucleosides from each other, which comprises contacting a solution containing nucleotides and nucleosides, after being adjusted to a pH of not more than 7, with activated carbon to absorb the nucleosides and nucleotides and then eluting the nucleotides with an aqueous solution of an alkali metal hydroxide, the said nucleotides being from the group of inosine-5'-monophosphate, guanosine-5'-monophosphate, adenosine-5'-monophosphate, xanthosine-5'-monophosphate, cytidine-5'-monophosphate, uridine-5'-monophosphate, deoxyadenosine-5'-monophosphate, deoxycytidine-5'-monophosphate, deoxyuridine-5'-monophosphate, inosine-2'(3'),5'-diphosphate, inosine-5'-diphosphate, guanosine-2'(3'),5'-diphosphate, guanosine-5'-diphosphate, adenosine-2'(3'),5'-diphosphate, adenosine-5'-diphosphate, cytidine-5'-diphosphate, uridine-5'-diphosphate, deoxyadenosine-5'-diphosphate, deoxycytidine-5'-diphosphate, deoxyuridine-5'-diphosphate, adenosine-5'-triphosphate, guanosine-5'-triphosphate, deoxyadenosine-5'-triphosphate, deoxyguanosine-5'-triphosphate, deoxyctidine-5'-triphosphate, deoxyuridine-5'-triphosphate, inosine-2'-monophosphate, guanosine-3'-monophosphate, adenosine-3',5'-cyclic monophosphate, and xanthine-2',3'-cyclic monophosphate, the said nucleosides being inosine, guanosine, adenosine, xanthosine, cytidine, uridine, thymidine and orotidine and a deoxyribose homolog of said compounds and the said activated carbon having pore characteristics such that not less than 0.6 cc/g of the total pore volume is occupied by pores having a diameter of not more than 15μ, not less than 0.4 cc/g of the total pore volume is occupied by pores having a diameter of not more than 300 Å and not less than 17 Å of an average pore diameter for pores having a diameter of not more than 300 Å and, following the nucleotide elution, eluting the nucleosides with an aqueous solution containing an alkali metal hydroxide and a lower alcohol.

2. A method of separation of nucleotides and 5-amino-4-imidazolecarboxyamidoriboside from each other, which comprises contacting a solution containing nucleotides and 5-amino-4-imidazolecarboxyamidoriboside, after being adjusted to a pH of not more than 7, with activated carbon to absorbe 5-amino-4-imidazolecarboxyamidoriboside and nucleotides and then eluting the nucleotides with an aqueous solution of an alkali metal hydroxide, the said nucleotides being from the group inosine-5'-monophosphate, quanosine-5'-monophosphate, adenosine-5'-monophosphate, xanthosine-5'-monophosphate, cytidine-5'-monophosphate, uridine-5'-monophosphate, deoxyadenosine-5'-monophosphate, deoxycytidine-5'-monophosphate, deoxyuridine-5'-monophosphate, inosine-2'(3'),5'-diphosphate, inosine-5'-diphosphate, guanosine-2'(3'),5'-diphosphate, guanosine-5'-diphosphate, adenosine-2'(3'),5'-diphosphate, adenosine-5'-diphosphate, cytidine-5'-diphosphate, uridine-5'-diphosphate, deoxyadenosine-5'-diphosphate, deoxycytidine-5'-diphosphate, deoxyuridine-5'-diphosphate, adenosine-5'-triphosphate, guanosine-5'-triphosphate, deoxyadenosine-5'-triphosphate, deoxyguanosine-5'-triphosphate, deoxycytidine-5'-triphosphate, deoxyuridine-5'-triphosphate, inosine-2'-monophosphate, guanosine-3'-monophosphate, adenosine-3',5'-cyclic monophosphate, and xanthine-2',3'-cyclic monophosphate, and the said activated carbon having pore characteristics such that not less than 0.6 cc/g of the total pore volume is occupied by pores having a diameter of not more than 15μ, not less than 014 cc/g of total pore volume is occupied by pores having a diameter of not more than 300 Å and not less than 17 Å of an average pore diameter for pores having a diameter of not more than 300 Å and following the

nucleotide elution, eluting the 5-amino-4-imidazolecarboxyamidoriboside with an aqueous solution containing an alkali metal hydroxide and a lower alcohol.

11. The method according to claim 1, wherein the nucleotides are 5'-inosinic acid or 5'-guanylic acid and the nucleosides are inosine or guanosine.

4,577,013

IONICALLY MODIFIED CELLULOSE MATERIAL, ITS PREPARATION AND ITS USE

Jürg Merz, Biel-Benken, and Walter Voser, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,690

Claims priority, application Switzerland, Dec. 22, 1983, 6856/83

Int. Cl.[4] C08B *15/06;* B01D *15/08*

U.S. Cl. 536—43 4 Claims

1. An ionically modified cellulose material in which each ionic moiety is linked to the cellulose moiety via a group of the formula

—O—CH_2—NH—CO—,

the carbonyl group being attached to the ionic moiety of the material and the oxygen atom being attached to the cellulose moiety of the material, which material is obtained from microcrystalline wood cellulose in the form of powder as the starting material, said cellulose powder having a degree of polymerisation of 490 to 550 and consisting of particles having a specific BET surface area of 0.8 to 1.1 m^2/g and a degree of swelling in water at 20° C. of 4 to 6 ml/g.

4,577,014

THIENO AND FUROPYRIDINIUM-SUBSTITUTED CEPHALOSPORINS

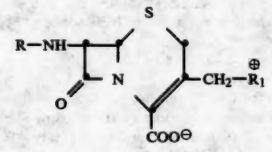
William H. W. Lunn, and Robert T. Vasileff, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 449,945, Dec. 15, 1982, Pat. No. 4,501,739, which is a continuation-in-part of Ser. No. 340,628, Jan. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 300,357, Sep. 8, 1981, abandoned. This application Dec. 7, 1984, Ser. No. 679,514

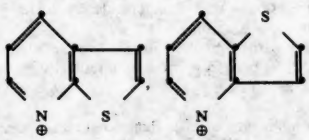
Int. Cl.[4] C07D *501/38;* A61K *31/545*

U.S. Cl. 544—022 7 Claims

1. The compound of the formula



wherein R is hydrogen, formyl, aminoadipoyl, or protected aminoadipoyl; $^{\oplus}R_1$ is a bicyclicpyridinium group selected from the group consisting of a thienopyridinium group of the formulas



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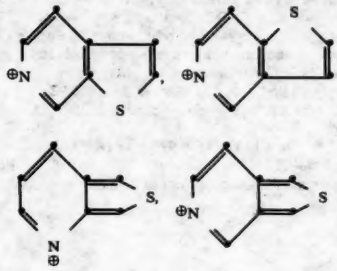
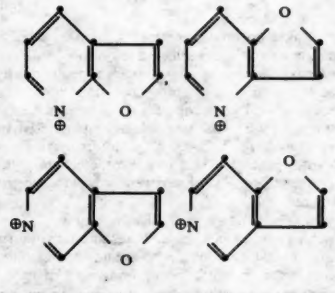


or a furopyridinium group of the formulas



and said thienopyridinium and said furopyridinium wherein either or both of the hetero rings thereof is substituted by one or two C_1–C_4 alkyl, halogen, carboxy, carbamoyl, or C_1–C_4 alkoxycarbonyl groups.

4,577,015

TRIPHENDIOXAZINE VINYL SULPHONE DYESTUFFS

Horst Jäger; Wolfgang Harms, both of Leverkusen, and Karl J. Herd, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

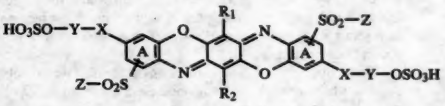
Filed Jan. 24, 1985, Ser. No. 694,535

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404856; Oct. 31, 1984, 3439756

Int. Cl.[4] C07D *498/02;* C09B *19/00, 19/02*

U.S. Cl. 544—76 3 Claims

1. Triphendioxazine dyestuffs of the general formula



wherein

R_1, R_2=H, F, Cl, Br, C_1–C_4-alkoxy, C_1–C_4-alkyl, phenoxy or acylamido;

X=NR_3, O or S wherein

R_3=H, C_1–C_4-alkyl, optionally substituted by SO_3H, OSO_3H, COOH, OH or OCH_3;

Y=C_2–C_6-alkylene which is optionally interrupted by O, SO_2, NH, S, NCH_3 or substituted by OSO_3H;

Z=—CH=CH_2 or —CH_2—CH_2—w wherein

W=OSO_3H, SSO_3H, OPO_3H_2, OC_1–C_4-alkylcarbonyl.

4,577,016
PROCESS FOR THE PREPARATION OF PENEM DERIVATIVES

Marco Alpegiani; Angelo Bedeschi; Maurizio Foglio; Giovanni Franceschi, and Ettore Perrone, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

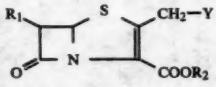
Filed Apr. 4, 1983, Ser. No. 481,924

Claims priority, application United Kingdom, Apr. 8, 1982, 8210410

Int. Cl.[4] C07D *499/00*; A61K *31/425*

U.S. Cl. 544—182 19 Claims

1. A process for the preparation of a compound of formula (I):



(I)

wherein R_1 is hydrogen;

a C_1–C_{12} alkyl group either unsubstituted or substituted by at least one substituent selected from the group consisting of hydroxy, amino, cyano, mercapto, protected hydroxy, protected amino and protected mercapto: a C_4–C_7 monocycloalkyl group or a C_4–C_7 monocycloalkyl group substituted by at least one substituent selected from the group consisting of C_1–C_6 alkyl, hydroxy, amino, cyano, mercapto, protected hydroxy, protected amino and protected mercapto; R_2 is hydrogen or a carboxy protecting group; and Y is

(a) a group —S—Het wherein Het is

(A) a pentatomic or hexatomic heteromonocyclic ring containing at least one double bond and at least one heteroatom selected from the group consisting of N, S and O, unsubstituted or substituted by at least one substituent selected from the group consisting of:

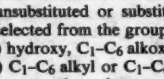
(a') hydroxy, C_1–C_6 alkoxy, halogen, C_2–C_6 aliphatic acyl;

(b') C_1–C_6 alkyl or C_1–C_6 alkyl substituted by a tetrazolyl group or by at least one hydroxy or halogen substituent:

(c') C_2–C_6 alkenyl or C_2–C_6 alkenyl substituted by at least one hydroxy or halogen substituent:

(d') —S—R3' wherein R_3 is hydrogen or C_1–C_6 alkyl; or —S—CH_2COOR_4, wherein R_4 is hydrogen, C_1–C_6 alkyl or a carboxy-protecting group;

(e') —$(CH_2)_m$—$COOR_4$ or —CH=CH—$COOR_4$, wherein m is 0, 1, 2 or 3 and R_4 is as defined above; —$(CH_2)_m$—CN or —$(CH_2)_m$—$CONH_2$, wherein m is as defined above; —$(CH_2)_m$—SO_3H, wherein m is as defined above, or



(f')

wherein m is as defined above, and each of R_5 and R_6, which may be the same or different, represents hydrogen, C_1–C_6 alkyl, sulfo, or an aliphatic acyl group or, when one of R_5 and R_6 is hydrogen, the other may also be an amino protecting group; or

(B) a heterobicyclic ring containing at least two double bonds, wherein each of the condensed heteromonocyclic rings, being the same or different, is a pentatomic or hexatomic heteromonocyclic ring containing at least one heteroatom selected from the group consisting of N, S and O, said heterobicyclic ring being unsubstituted or substituted by at least one substituent selected from the group consisting of (a'), (b'), (c'), (d'), (e') and (f') as defined above;

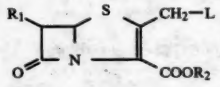
(b) a formyloxy or a C_2–C_6 carboxylic acyloxy group wherein the acyl group may be unsubstituted or substituted by halogen, C_2–C_6 carboxylic acyl, amino, hydroxy, mercapto, protected amino, protected hydroxy or protected mercapto;

(c) a C_1–C_{12} alkoxy or C_1–C_{12} alkylthio both optionally substituted by at least one substituent selected from the group consisting of halogen, formyl, C_2–C_6 acyl, amino, hydroxy, mercapto, protected amino, protected hydroxy and protected mercapto;

(d) a pyridinium group or a carbamoyl substituted pyridinium;

(e) azido, and the pharmaceutically or veterinarily acceptable salts thereof, said process comprising:

displacing the group L, in the presence of an organic solvent, in a compound of formula (II):



(II)

wherein R_1 and R_2 are as defined above and the group L is chlorine, bromine, hydroxy or an activated hydroxy group with a group Y, in a compound of formula III:

Y—H (III)

wherein group Y is as defined above, a salt thereof or a reactive derivative thereof wherein the activated hydroxy group is one capable of reacting with a compound YH or salt thereof to form a —CH_2—Y bond in formula (I), said salt of compound YH being capable of reacting with a compound (II) when L is an activated hydroxy group as hereinbefore defined to form a —CH_2—Y bond in formula (I), and the reactive derivative of the compound YH is one capable of reacting with compound (II) when L is a free hydroxy group to form a —CH_2—Y bond in formula (I), the reaction to cause the displacement being carried out under conditions to form said —CH_2—Y bond wherein the group Y displaces the group L in said compound (II) to form said compound (I), with the proviso that when Y in formula (I) is pyridinium or carbamoyl substituted pyridinium, then Y in formula (II) is pyridinyl or carbamoyl substituted pyridinyl.

4,577,017
PROCESS FOR THE PREPARATION OF AN ISOCYANURATE COMPOUND CONTAINING ISOCYANATE GROUPS

Willem J. H. Hupperetz, Schinnen, and Johannes A. H. M. Ramakers, Beek (L.), both of Netherlands, assignors to DSM Resins B.V., Zwolle, Netherlands

Filed Sep. 12, 1984, Ser. No. 649,609

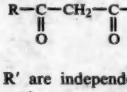
Claims priority, application Netherlands, Sep. 13, 1983, 8303152

Int. Cl.[4] C07D *251/30*

U.S. Cl. 544—193 10 Claims

1. Process for the preparation of an isocyanurate compound containing isocyanate groups by trimerizing a diisocyanate in the presence of a catayst, wherein the catalyst is:

I a compound having the formula



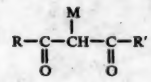
where R and R' are independently selected from the group consisting of:

a hydrocarbon radical with 1–10 carbon atoms, —O—R_1 with R_1 being a hydrocarbon radical with 1–10 carbon atoms, and

H,

in combination with an alkalimetal alkanolate, or

II a compound having the formula



where R and R′ have the same meanings as above, and M represents a univalent metal.

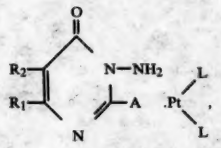
4,577,018

2,3-DIAMINO-SUBSTITUTED-4(3H)-PYRIMIDINONES AND PLATINUM CHELATES

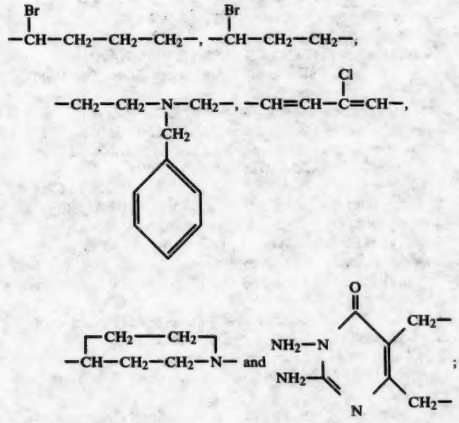
Joseph J. Hlavka, Tuxedo; Panayota Bitha, Pomona, and Yang-i Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1983, Ser. No. 525,531
Int. Cl.[4] C07F *15/00*; C07D *471/14, 471/04, 487/04*
U.S. Cl. 544—225 15 Claims

1. A compound of the formula:



wherein R_1 is alkyl(C_1–C_6), trifluoromethyl, phenyl, p-chlorophenyl or p-nitrophenyl; R_2 is hydrogen, alkyl(C_1–C_4), halogen, benzyl or hydroxyethyl; R_1 and R_2 taken together is a divalent moiety selected from the group consisting of $-(CH_2)_n-$ wherein n is an integer 3–6,



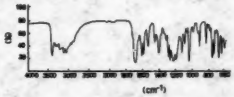
A is amino or hydrazino; and L and L′ are the same and are anions selected from the group consisting of halide, nitrate, sulfate and (C_2–C_6) alkanoate of L and L′ taken together is a dibasic anion selected from the group consisting of oxalate, malonate, methylmalonate, succinate, and tartronate.

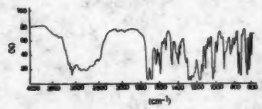
4,577,019

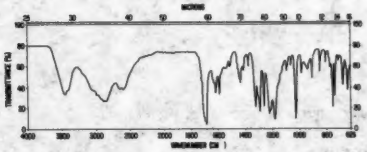
STABILIZED ADDUCTS OF MENADIONE BISULFITE WITH P-AMINOBENZOIC ACID OR ADENINE

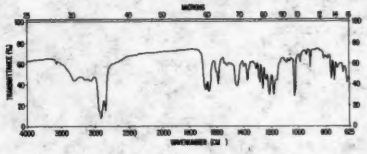
Enrico Bruschi, Genoa, Italy, assignor to Luigi Stoppani S.p.A., Milan, Italy

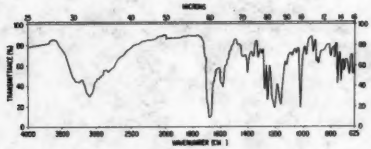
Continuation of Ser. No. 273,379, Jun. 15, 1981, abandoned, which is a continuation of Ser. No. 102,445, Dec. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,031, Dec. 19, 1978, abandoned. This application Aug. 2, 1983, Ser. No. 518,769
Claims priority, application Italy, Jul. 21, 1978, 26008 A/78
Int. Cl.[4] C07D *473/34*; C07C *49/66*
U.S. Cl. 544—264 2 Claims

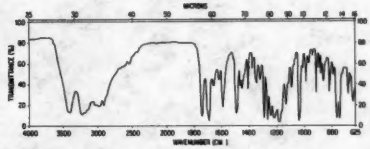


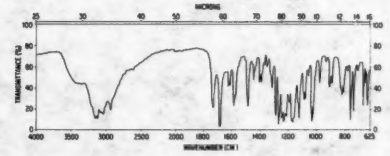












1. Adducts of menadione bisulfite with p-aminobenzoic acid

having the general formula: $C_{18}H_{17}O_7NS$, m.w. 391.4; menadione 42.5% by weight; p-aminobenzoic acid 35.1% by weight.

2. Adducts of menadione bisulfite with adenine having the general formula: $C_{16}H_{15}N_5O_5S$, m.w. 389.42; menadione 43.2% by weight; adenine 34.5% by weight.

4,577,020

AMINOALKYL AND AMINOALKENYL TRIAZOLES AS ANTI-PSYCHOTIC AGENTS

Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

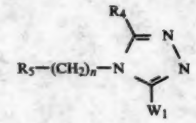
Filed Jan. 25, 1983, Ser. No. 460,723

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.[4] C07D *403/06, 249/08;* A61K *31/495, 31/41*

U.S. Cl. 544—366 **5 Claims**

1. A compound of the Formula I,



I

or an enantiomer or stereoisomer thereof,

wherein P_4 is

(a) hydrogen,

(b) (C_1–C_3) alkyl,

(c) $—CH_2OH$,

(d) $—CH_2OCOCH_3$,

(e) $—S(O)_qCH_3$,

(f) $—SCH_2CH_3$, or

(g) $—R_{15}$;

wherein R_5, R_{15}, and R_{25} are the same or different and are

(a) phenyl substituted by zero to 2 chloro, fluoro, bromo, alkyl of from one to 3 carbon atoms, nitro, or alkoxy of from one to 3 carbon atoms, or

(b) phenyl substituted by one trifluoromethyl and zero to one of the previous phenyl substituents;

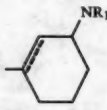
wherein W_1 is

(a) cis—$C(R_3)$=$CH—CH_2NR_1R_2$,

(b) trans—$C(R_3)$=$CH—CH_2NR_1R_2$,

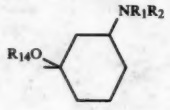
(c) $—C(CH_3)(OR_{14})—CH_2—CH_2NR_1R_2$,

(d) a substituent of the Formula III, or



III

(e) a substituent of the Formula IV;



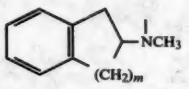
IV

wherein $—NR_1R_2$ is

(a) $—N(CH_3)—CH_2(CH_2)_m—R_{25}$,

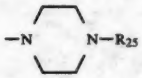
(b) $—NH—CH_2(CH_2)_mR_{25}$,

(c) a substituent of the Formula V,



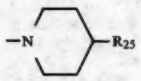
V

(d) a substituent of the Formula VI,



VI

(e) a substituent of the Formula VII, or



VII

(f) $—N(CH_3)—(CH_2)_3—CH(R_{51})_2$;

wherein R_{14} is

(a) hydrogen,

(b) $—COCH_3$, or

(c) $—COCH_2CH_3$;

wherein R_{51} is

(a) phenyl,

(b) p-fluorophenyl, or

(c) p-chlorophenyl;

wherein R_3 is

(a) hydrogen or

(b) methyl;

wherein the dotted line represents a single or double bond;

wherein m is an integer of from one to 2, inclusive;

wherein n is an integer of from zero to 3, inclusive; and

wherein q is an integer of from zero to 2, inclusive; or a pharmacologically acceptable acid addition salt; or solvate or hydrate thereof.

4,577,021

1H-2-BENZOPYRAN-1-YL ALKYL ON 1-(ISOCHROMAN-1-YL)ALKYL PIPERAZINES

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 26,719, Apr. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 847,350, Oct. 31, 1977, abandoned. This application Apr. 1, 1985, Ser. No. 718,199

Int. Cl.[4] C07D *405/06, 413/06*

U.S. Cl. 544—376 **14 Claims**

1. A compound selected from the group consisting of

4-(2-methylphenyl)-1-[3-(3,4-dihydro-6,7-dimethoxy-1,4-dimethyl-1H-2-benzopyran-1-yl)-propyl]piperazine;

4-(2-methylphenyl)-1-[3-(3,4-dihydro-6,7-dimethoxy-1,4-dimethyl-1H-2-benzopyran-1-yl)-propyl]piperazine, monohydrochloride;

1-[2-(3,4-dihydro-6,7-dimethoxy-4,4-dimethyl-1H-2-benzopyran-1-yl)ethyl]-4-(2-methylphenyl)piperazine;

1-[2-(3,4-dihydro-6,7-dimethoxy-4,4-dimethyl-1H-2-benzopyran-1-yl)ethyl]-4-(2-methylphenyl)piperazine, monohydrochloride;

1-[2-(6,7-dimethoxy-4,4-dimethylisochroman-1-yl)ethyl]-4-(3-trifluoromethylphenyl)piperazine;

1-[2-(6,7-dimethoxy-4,4-dimethylisochroman-1-yl)ethyl]-4-(3-trifluoromethylphenyl)piperazine, dihydrochloride;

4-(2-methylphenyl)-1-[3-(3,4-dihydro-6,7-dimethoxy-1,4,4-trimethyl-1H-2-benzopyran-1-yl)-propyl]piperazine;

4-(2-methylphenyl)-1-[3-(3,4-dihydro-6,7-dimethoxy-1,4,4-

trimethyl-1H-2-benzopyran-1-yl)-propyl]piperazine, dihydrochloride;
4-(2-methylphenyl)-1-[3-(3,4-dihydro-1-(4-fluorophenyl)-6,7-dimethoxy-1H-2-benzopyran-1-yl)propyl]piperazine;
4-(2-methylphenyl)-1-[3-(3,4-dihydro-1-(4-fluorophenyl)-6,7-dimethoxy-1H-2-benzopyran-1-yl)propyl]piperazine, hydrochloride hydrate;
4-(2-methylphenyl)-1-[2-(3,4-dihydro-6,7-dimethoxy-3,3-dimethyl-1H-2-benzopyran-1-yl)-ethyl]piperazine;
4-(2-methylphenyl)-1-[2-(3,4-dihydro-6,7-dimethoxy-3,3-dimethyl-1H-2-benzopyran-1-yl)-ethyl]piperazine, monohydrochloride; and
1-[3-(3,4-dihydro-6,7-dimethoxy-1-methyl-1H-2-benzopyran-1-yl)propyl]-4-(2-methylphenyl)piperazine.

4,577,022

SILYL COMPOUNDS

Roger Crossley, Reading, and Robin G. Shepherd, Maidenhead, both of England, assignors to John Wyeth & Brother, Ltd., Maidenhead, England

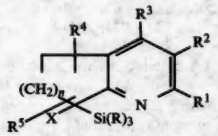
Filed Jun. 21, 1983, Ser. No. 506,277

Claims priority, application United Kingdom, Jun. 25, 1982, 8218466

Int. Cl.⁴ C07D *215/16*

U.S. Cl. 546—14 **19 Claims**

1. A silyl compound of formula I



(I)

cycloalkyl, C_7–C_{12} aralkyl or phenyl radicals, any of which cyclic radicals may be substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl; or

R^1 and R^2 taken together or R^2 and R^3 taken together, with the carbon atoms to which they are attached, form a 5-, 6-, or 7-membered carbocyclic ring, and when R^1 and R^2 form a ring, the ring has the same number of carbon atoms as the ring carrying R^4; or

R^4 and R^5 may also represent C_1–C_6 alkoxy;

n is one of the integers 1, 2 or 3;

X is hydrogen or lithium, sodium or potassium; and

R is C_1–C_6 alkyl, C_4–C_6 cycloalkyl, C_7–C_{12} aralkyl or phenyl which may be substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl; or

R is an electron dontating group selected from C_1–C_6 alkoxy, C_4–C_6 cycloalkoxy, C_7–C_{12} aralkoxy, phenoxy which may be substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl, C_1–C_6 alkylthio, C_4–C_6 cycloalkylthio, C_7–C_{12} aralkylthio, the group R^bR^cN- wherein R^b and R^c are selected from C_1–C_6 alkyl, C_4–C_6 cycloalkyl, phenyl and C_7–C_{12} aralkyl or R^b and R^c may be joined to form a pyrrolidine or piperidine with the nitrogen atom ring, which pyrrolidine or piperidine ring may be substituted by C_1–C_6 alkyl or C_4–C_6 cycloalkyl.

4,577,023

DIAZABICYCLO (2,2,2) OCTADIONES

Antonius Corvers, Beek, and Johannes H. A. Hofman, Elsloo, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

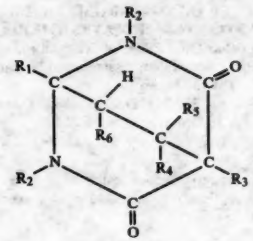
Continuation-in-part of Ser. No. 442,975, Nov. 19, 1982, abandoned. This application May 25, 1984, Ser. No. 614,241

Claims priority, application Netherlands, Nov. 21, 1981, 8105277; Canada, Nov. 19, 1982, 415988

Int. Cl.⁴ C07D *471/08*

U.S. Cl. 546—122 **9 Claims**

1. A diazabicyclo(2,2,2)octadione having the formula



I

wherein R_1–R_6 are independently selected from the group consisting of hydrogen, methyl, and ethyl.

4,577,024

OXOINDOLIZINE AND OXOINDOLIZINIUM COMPOUNDS USEFUL AS DYES

George L. Fletcher, Jr., Pittsford, N.Y.; Steven L. Bender, Pasadena, Calif., and Donald H. Wadsworth, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 278,022, Jun. 29, 1981, abandoned. This application Aug. 27, 1982, Ser. No. 412,444

Int. Cl.⁴ C07D *471/04*

U.S. Cl. 546—183 **15 Claims**

1. A dye selected from the group consisting of oxoindolizine and oxoindolizinium dyes and combinations thereof wherein

(a) the oxo group of said dyes is in the 1- or 3-position of the oxoindolizine or oxoindolizinium nucleus,

(b) said dyes contain in the 7-position of the oxoindolizine or oxoindolizinium nucleus a chromophore group which enables said dyes to have a maximum absorption of electromagnetic radiation at wavelengths within the range of 300 to 1000 nanometers, and

(c) said oxoindolizine or oxoindolizinium nucleus contains, in at least one of the 1-, 2- and 3-positions, alkyl containing 1 to 18 carbon atoms, aryl containing 6 to 20 carbon atoms, or aryl containing 6 to 20 carbon atoms substituted by alkyl containing 1 to 5 carbon atoms, alkoxy containing 1 to 5 carbon atoms, or aryloxy containing 6 to 10 carbon atoms.

2. A dye selected from the group consisting of

(i) 7-methylidene-1 or 3-oxoindolizine dyes;

(ii) 7-(4-oxo-2,5-cyclohexadiene-1-ylidene)-1 or 3-oxoindolizine dyes;

(iii) 7-(1 or 3-oxoindolizin-7-ylidene)-1 or 3-oxoindolizine dyes;

(iv) 7-(1 or 3-oxoindolizin-7-ylidene)ethylidene-1 or 3-oxoindolizine dyes;

(v) 7-(1 or 3-oxoindolizin-7-ylidene)methyliene-1 or 3-oxoindolizinium salt dyes;

(vi) 7-(2 or 4-aminoaryl)-1 or 3-oxoindolizine dyes; and

(vii) 7-pyridinium-1 or 3-oxoindolizine dyes; and combinations of said dyes;

wherein said dyes contain, in the 7-position of the indolizine or indolizinium nucleus, a chromophore group which enables said dyes to have a maximum absorption of electromagnetic radiation at a wavelength within the range of 300 to 1000 nanometers; and

wherein said indolizine or indolizinium nucleus contains, in at least one of the 1-, 2- and 3-positions, alkyl containing 1 to 18 carbon atoms, aryl containing 6 to 20 carbon atoms, or aryl containing 6 to 20 carbon atoms substituted by alkyl containing 1 to 5 carbon atoms, alkoxy containing 1 to 5 carbon atoms, or aryloxy containing 6 to 10 carbon atoms.

4,577,025

METHOD OF PREPARING α-AROMATIC PROPIONIC ACIDS AND INTERMEDIATES THEREOF

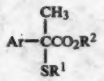
Kazutaka Arai; Yoshio Ohara; Yashio Takakuwa, and Toyoko Iizumi, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 332,961, Dec. 21, 1981. This application Aug. 26, 1983, Ser. No. 527,179

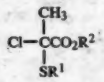
Int. Cl.⁴ C07D *211/34, 333/02, 333/24, 277/60*

U.S. Cl. 546—198 **26 Claims**

1. A method of preparing an ester of α-thio-α-aromatic propionic acid derivatives represented by the general formula:



wherein R^1 is an alkyl group, a phenyl group or a benzothiazolyl group, R^2 is an alkyl group and Ar is an aromatic group, which comprises reacting an ester of α-chloro-α-thiopropionic acid represented by the general formula:



wherein R^1 and R^2 are as defined above, with an aromatic compound represented by the general formula:

ArH

wherein Ar is as defined above, in the presence of a Lewis acid.

4,577,026

INTERMEDIATES FOR SPIRO[2H-1,4-BENZODIOXEPIN-3(5H)4'PIPERIDINE] COMPOUNDS

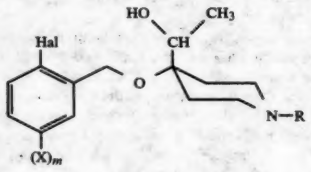
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 516,832, Jul. 25, 1983, Pat. No. 4,472,580, which is a division of Ser. No. 410,155, Aug. 20, 1982, Pat. No. 4,405,631. This application Jul. 12, 1984, Ser. No. 630,134

Int. Cl.⁴ C07D *211/48*

U.S. Cl. 546—216 **9 Claims**

1. A compound of the formula



in which

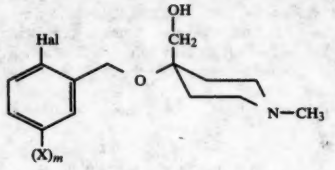
R is selected from the group consisting of hydrogen or a methyl or benzyl group;

Hal is fluorine;

X is fluorine; and

m is zero or 1.

7. A compound of the formula



in which

Hal is fluorine;

X is fluorine; and

m is zero or 1.

4,577,027

PRODUCTION OF POLYCHLORINATED PYRIDINE MIXTURES BY DIRECT LIQUID PHASE CHLORINATION OF ALPHA-PICOLINE

Michael J. Marinak, Kelso, and John L. Simonson, Longview, both of Wash., assignors to Kalama Chemical, Inc., Kalama, Wash.

Continuation-in-part of Ser. No. 422,753, Sep. 24, 1982, abandoned. This application Feb. 22, 1983, Ser. No. 468,282

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.⁴ C07D *213/61*

U.S. Cl. 546—345 **10 Claims**

1. The process of producing high yields of mixtures rich in chlorinated picolines and chlorinated pyridines by non-catalytically chlorinating alpha-picoline directly with chlorine in the liquid phase without substantial formation of intractable mixtures of tars and polymers, said process comprising:

(a) establishing in a first non-catalytic reactor means a diluent reactor charge made up of chlorinated pyridine and/or chlorinated picoline compounds, said diluent being essentially nonreactive with chlorine in the sense of having the characteristic of generating less than one mole of hydrogen chloride per mole of diluent under the reaction conditions to which the reactants in said first reactor are subjected;

(b) while maintaining the reactor charge in the liquid phase and at a temperature of about 100° C. to about 250° C., continuously sparging both chlorine and alpha-picoline into the reactor charge near the bottom thereof and at a chlorine-to-picoline ratio of at least about 5:1 by weight and at an alpha-picoline feed rate low enough so that any separation of the reactor charge into a second, lighter phase composed of unchlorinated alpha-picoline is less than about 10% of the reactor charge by volume at temperatures in excess of 120° C.; and

(c) continuing chlorine addition and maintaining the reaction mass in the liquid phase at a temperature of at least about 155° C. in a second non-catalytic reactor means until the desired extent of side chain and nuclear substitution of chlorine in the alpha-picoline has occurred.

4,577,028

5-HALOALKYL-PYRIDINES

Pierre Martin, Rheinfelden, and Eginhard Steiner, Füllinsdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

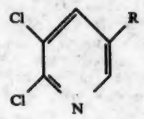
Filed Oct. 14, 1982, Ser. No. 434,433

Claims priority, application Switzerland, Oct. 20, 1981, 6692/81; Dec. 29, 1981, 8328/81; Sep. 1, 1982, 5195/82

Int. Cl.⁴ C07D *213/26;* **C07C** *47/14*

U.S. Cl. 546—345 **12 Claims**

1. A compound of the formula:



wherein R is mono-, poly- or perhalogenated alkyl group of 2 carbon atoms.

4,577,029

DERIVATIVE OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITION CONTAINING THE SAME AS ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Yoichi Kanda; Keigo Satake; Hiroyasu Shinkawa, and Shiro Yamazaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,049

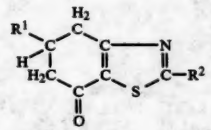
Claims priority, application Japan, May 10, 1982, 57-77798; Apr. 8, 1983, 58-61926

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] C07D *417/04*

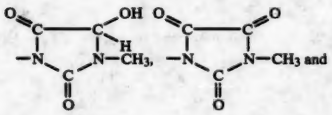
U.S. Cl. 548—162 2 Claims

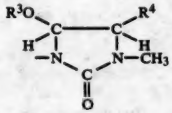
1. A derivative of tetrahydrobenzothiazole represented by the general formula (I):



(I)

wherein R^1 represents a hydrogen atom, a straight-chain alkyl group having 1 to 6 carbon atoms or branched-cahin alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms or a phenyl group and R^2 represents a chemical group selected from the group consisting of:





wherein R^3 represents a hydrogen atom, a methyl group or an acetyl group and R^4 represents a hydrogen atom, a hydroxyl group, methoxy group or acetoxy group.

4,577,030

AZOLYL-SUBSTITUTED PHENOXY-AMINOPROPANOL DERIVATIVES

Peter J. Machin, London, England, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

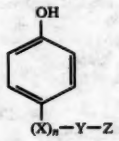
Division of Ser. No. 237,612, Feb. 24, 1981, Pat. No. 4,387,100. This application Mar. 14, 1983, Ser. No. 475,290

Claims priority, application United Kingdom, Feb. 25, 1980, 8006261; Nov. 10, 1980, 8035997

Int. Cl.[4] C07D *249/04, 249/08*

U.S. Cl. 548—255 4 Claims

1. A compound of the formula



wherein X is oxygen, n is 1, Y is methylene, ethylene or propylene and Z is a 5-membered aromatic heterocyclic ring selected from the group consisting of 1H-1,2,3-triazol-1-yl or 2H-1,2,3-triazol-2-yl.

4,577,031

POLYMERIZABLE IMIDAZOLIDINONES

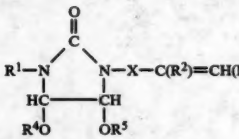
Carmine P. Iovine, Bridgewater; Joseph G. Palmer, Rocky Hill, and James L. Walker, Whitehouse Station, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 473,922, Mar. 10, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 715,218

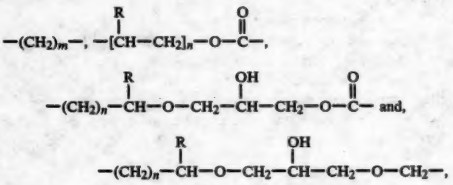
Int. Cl.[4] C07D *233/40*

U.S. Cl. 548—319 20 Claims

1. As a composition of matter, an imidazolidinone monomer having the structure:



wherein R^1 is hydrogen or a linear or branched C_1–C_6 alkyl group when attached to a nitrogen; X is a divalent radical selected from the group consisting of



with R being hydrogen or a methyl group, m being an integer from 0–5, and n being an integer from 1–5; R_2 is hydrogen or a methyl group; R^3 is hydrogen or a

group, with R^1 being hydrogen or a linear or branched C_1–C_6 alkyl or hydroxyalkyl when attached to an oxygen; and R_4 and

R_5 are independently hydrogen or a C_1–C_4 linear or branched alkyl group.

4,577,032

1-BENZOYLDIBROMOMETHYL-2-METHYLIMIDAZOLE AS A FUNGICIDAL AGENT

Takayuki Fujita, 233-8, Aza Inamoto, Nakakirai, Matsushigecho, Itano-gun, Tokushima-ken; Yoshikazu Kitazawa, 42-1, Aza Kowake, Ejiri, Kitajima-cho, Itano-gun, Tolushima-ken; Tadashi Akita, 2-3, Hachiban-cho, Sako, Tokushima-shi, Tokushima-ken, and Isamu Tani, 344-2, Myodo-cho 1-chome,, Tokushima-shi, Tokushima-ken, all of Japan

Filed Jun. 15, 1984, Ser. No. 621,104
Int. Cl.[4] C07D *233/60*
U.S. Cl. 548—341 **1 Claim**

1. 1-benzoyldibromomethyl-2-methylimidazole.

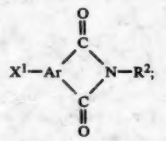
4,577,033

HETEROCYCLIC QUATERNARY AMMONIUM SALTS AS PHASE TRANSFER CATALYSTS FOR AROMATIC ETHER IMIDE PREPARATION

John W. Verbicky, Jr., Scotia, and Alice M. Colley, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,037
Int. Cl.[4] C07D *209/48*
U.S. Cl. 548—461 **10 Claims**

1. In a method for preparing an aromatic ether imide by the reaction, in a non-polar organic solvent in the presence of a phase transfer catalyst, of (A) at least one hydroxyaromatic compound alkali metal salt having formula I $R^1(OM)_a$ (I) where R^1 is an aromatic radical containing about 6–30 carbon atoms, M is an alkali metal and a is 1 or 2, with (B) at least one substituted imide having formula II



(II)

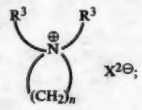
wherein

Ar is an aromatic radical,

R^2 is hydrogen or a hydrocarbon-based radical containing about 1–13 carbon atoms and

X^1 is halo or nitro;

the improvement which comprises using as said phase transfer catalyst (C) at least one heterocyclic quaternary salt having formula III



(III)

wherein

R^3 is a lower alkyl radical,

X^2 is one equivalent of an anion-forming atom or radical and n is an integer from 4 to 6.

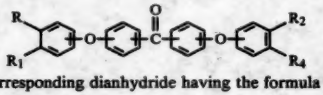
4,577,034

AUTOXIDATION OF BIS(ORTHO DIALKYL-PHENOXY)BENZOPHENONES

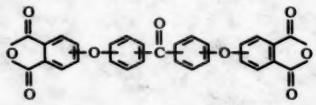
Visweswara R. Durvasula, Cheshire, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 14, 1985, Ser. No. 701,835
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—241 **9 Claims**

1. A method for converting a bis(ortho dialkyl-phenoxy)benzophenone having the formula (I)



to the corresponding dianhydride having the formula (II)



wherein R, R_1, R_2, and R_3 are independently selected from linear lower alkyl, said method comprising autoxidizing said benzophenone (I) in a solution of an aliphatic monocarboxylic acid having 3 to 8 carbon atoms with oxygen in the presence of a heavy metal oxidation catalyst and a promoter and at a temperature of at least about 120° C. to form said dianhydride (II).

4,577,035

2,2'-ISOPROPYLIDINE BIS(TETRAHYDROFURAN)

George W. Huffman, 6502 Vermont Trail, Crystal Lake, Ill. 60014; William J. Pentz, 61 Margaret Ter.; David E. Vietti, 720 Millwood, both of Cary, Ill. 60013, and Joseph P. Wuskell, 11 Lowell Rd., West Hartford, Conn. 06119

Filed Nov. 28, 1984, Ser. No. 675,710
Int. Cl.[4] C07D *307/12*
U.S. Cl. 549—472 **1 Claim**

1. The composition of matter 2,2'-isopropylidine bis(tetrahydrofuran).

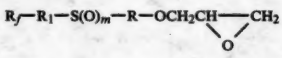
4,577,036

PERFLUOROALKYL-ALKYL-THIO, SULFINYL OR SULFONYL-ALKYLENE GLYCIDYL ETHER

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 30, 1985, Ser. No. 696,552
Int. Cl.[4] C07D *303/46, 303/36, 303/34*
U.S. Cl. 549—556 **10 Claims**

1. A perfluoroalkyl-alkylthio(sulfinyl or sulfonyl)alkylene glycidyl ether of the formula



(I)

wherein

R_f is straight or branched chain perfluoroalkyl of 3 to 18 carbon atoms or perfluoroalkoxyperfluoroalkyl of 3 to 18 carbon atoms;

R_1 is straight or branched chain alkylene of up to six carbon atoms, carboxamidoalkylene of up to six carbon atoms, or sulfonamidoalkylene of up to six carbon atoms, and wherein the amido nitrogen thereof is unsubstituted or substituted by lower alkyl;

m is 0, 1 or 2; and

R is straight or branched chain alkylene of 2 to 12 carbon atoms.

4,577,037

METHODS FOR PREVENTING THE PRECIPITATION OF MIXED ZINC DIALKYLDITHIOPHOSPHATES WHICH CONTAIN HIGH PERCENTAGES OF A LOWER ALKYL GROUP

Thomas F. Buckley, Hercules, Calif., assignor to Chevron Research, San Francisco, Calif.

Filed Feb. 10, 1984, Ser. No. 579,067
Int. Cl.[4] C07F 3/06
U.S. Cl. 556—25 5 Claims

1. In a process for the preparation of a mixed zinc dialkyldithiophosphate by the reaction of phosphorus pentasulfide with from about 50–80 mole percent of lower alcohol and from about 50–20 mole percent of higher alcohol followed by neutralization of the resulting mixed dialkyldithiophosphoric acid with a basically reacting zinc compound, wherein the improvement comprises the addition to said reaction of an effective amount of an ammonium salt of a carboxylic acid having from 1 to 6 carbon atoms to prevent precipitation of said mixed zinc composition.

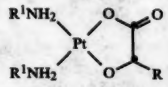
4,577,038

GLYCOLIC ACID TYPE PLATINUM COMPLEXES

Tetsushi Totani, Hyogo, and Katsutoshi Aono, Nara, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 4, 1984, Ser. No. 606,961
Claims priority, application Japan, Jun. 1, 1983, 58-98631
Int. Cl.[4] C07F 15/00
U.S. Cl. 556—137 14 Claims

1. A compound of the formula:



(wherein R is C_1–C_6 alkyl, hyroxymethyl, halomethyl, or phenyl; R^1 is hydrogen or C_1–C_6 alkyl; with proviso that R is not hydroxymethyl, when R^1 is hydrogen).

4,577,039

METHOD OF PREPARING HEXAMETHYLCYCLOTRISILAZANE

Barry C. Arkles, Ambler, and Burrell N. Hamon, Fairless Hills, both of Pa., assignors to Petrarch Systems Inc., Bristol, Pa.

Filed Jul. 15, 1985, Ser. No. 755,049
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—409 14 Claims

1. A process for the preparation of cyclotrisilazane comprising heating cyclotetrasilazane in the presence of hydrogen and a catalyst selected from the Group VIII metal catalysts.

4,577,040

METHOD FOR PREPARING DIORGANOPOLYSILOXANES CONTAINING FLUOROALKYL GROUPS

Rudolf Kaufmann; Karl Braunsperger; Karl-Heinrich Wegehaupt, all of Burghausen, Fed. Rep. of Germany, and Günter von Au, Sao Paulo, Brazil, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 16, 1983, Ser. No. 552,578
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248546
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—462 4 Claims

1. A method for preparing diorganopolysiloxanes containing fluoroalkyl groups and/or fluoroalkyloxyalkyl groups which comprises

(a) hydrolyzing at least one silane of the formula:

$$R^1R^2SiCl_2$$

where R^1 is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms and an aryl radical; R^2 is a radical selected from the group consisting of R_F—CH_2—CH_2—, where R_F is a perfluoro radical having from 1 to 12 carbon atoms and a fluoroalkyloxyalkyl radical having the formula:

$$C_nR_{2n+1}{}^3OR^4$$

where R^3 is hydrogen and fluorine; R^4 is a divalent aliphatic radical having from 2 to 6 carbon atoms and n is an integer from 1 to 6, and thereafter

(b) equilibrating the hydrolyzate in the presence of a compound having the formula:

$$[R_3{}^5R^6N]OH$$

where R^5 is an alkyl radical having from 1 to 4 carbon atoms and R^6 is selected from the group consisting of R^5 and the benzyl radical.

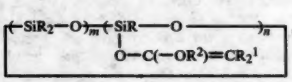
4,577,041

CYCLIC ORGANOPOLYSILOXANE COMPOUND

Masatoshi Arai; Koji Futatsumori; Takeo Inoue, and Shinichi Sato, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1985, Ser. No. 749,174
Claims priority, application Japan, Jun. 29, 1984, 59-134175
Int. Cl.[4] C07F 7/04, 7/08, 7/18
U.S. Cl. 556—446 1 Claim

1. A cyclic organopolysiloxane compound represented by the general formula



in which R is a group selected from the class consisting of halogenated or unhalogenated monovalent hydrocarbon groups having 1 to 8 carbon atoms and a trimethylsiloxy group, R^1 is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms, R^2 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms, m is zero, 1, 2 or 3 and n is 2, 3 or 4 with the proviso that m+n is 4 or 5.

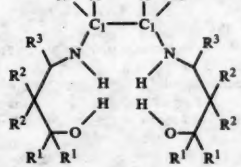
4,577,042

HOMOGENEOUS COORDINATION COMPOUNDS AS OXIDATION CATALYSTS

Terrence J. Collins, Pasadena; Fred C. Anson, Altadena, both of Calif.; Stephen L. Gipson, Florissant, Mo., and Terry E. Krafft, Greeley, Colo., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 17, 1983, Ser. No. 476,364
Int. Cl.[4] C07C 103/24, 103/38
U.S. Cl. 564—158 3 Claims

1. A compound forming a tetradendate, tetraanionic ligand with a metal selected from compounds of the formula:



where

R^1 is F or CF_3, aliphatic or aromatic;

R^2 is H or aliphatic; and

R^1 and R^2 can be combined to form an aromatic group such as benzene protected by electron withdrawing, substituent groups, such as Cl, F, NO_2, CN or a sterically hindered group, such as t-butyl;

R^3 is O; and

R^4 is hydrogen or aliphatic, such as alkyl groups of 1 or more carbon atoms, or the R^4 groups are replaced by one aromatic ring linking their adjoining atoms C_1 and C_2.

4,577,043

PROCESS FOR THE PREPARATION OF ALDEHYDES

Heinz Kalbfell, Shermbeck; Bernhard Lieder, Bottrop, and Herbert Mercamp, Dinslaken, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,357

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341035

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 9 Claims

1. In a process for the preparation of aldehydes comprising reacting olefins of 2 to 15 carbon atoms with carbon monoxide and hydrogen in a reactor in the presence of water and water-soluble rhodium phosphine complex catalysts at temperatures of from about 90° to 150° C. and pressures from about 1 to about 300 bar; separating said liquid phase into first aqueous and first organic phases without prior cooling; and returning said first aqueous phase containing said catalyst to the reactor;

the improvement which comprises cooling said first organic phase to from about 20° C. to about 40° C.; subsequently relieving the pressure with consequent formation of waste gas; separating said first organic phase into second organic and second aqueous phases; and distilling said second organic phase to yield a third aqueous phase and the aldehyde with one more carbon atom than the olefin.

4,577,044

PREPARATION OF CHLOROTRIFLUOROETHYLENE TELOMERS WITH FLUOROXYTRIFLUOROMETHANE

Donald H. Campbell, Niagara-on-the-Lake, Canada; Michael J. Fifolt, and Mohan S. Saran, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 545,020, Oct. 24, 1983. This application Feb. 11, 1985, Ser. No. 700,209

Int. Cl.[4] C07C *41/06, 179/00*

U.S. Cl. 568—677 10 Claims

1. A process for producing a mixture of telomers consisting of reacting chlorotrifluoroethylene in liquid form with fluoroxytrifluoromethane in the absence of a solvent.

4,577,045

METHOD FOR THE PRODUCTION OF ANHYDROUS POTASSIUM TERT.BUTOXIDE

Reinhard Matthes, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,369

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413212

Int. Cl.[4] C07C *29/70*

U.S. Cl. 568—851 4 Claims

1. A method for continuous production of anhydrous potassium tert.butoxide comprising

reacting aqueous potash lye with tert.butyl alcohol in a packed distillation column, and removing water by distillation using cyclohexane and/or hexane as withdrawing agent,

the tert.butyl alcohol being present in such excess of the aqueous potash lye and the withdrawing agent such that there is a 10 to 18 wt.-% solution of potassium tert.butoxide in the column bottom and the tert.butyl alcohol of the gas mixture at the center of the column is between 50 and 90 wt.-%; distilling out a mixture of the withdrawing agent, tert.butyl alcohol and water at the column top at temperatures of between 65° and 75° C.;

withdrawing the solution of potassium tert.butoxide produced in the column bottom; and

obtaining anhydrous potassium tert.butoxide from the withdrawn solution.

4,577,046

DEAMINATION OF AROMATIC AMINES

Mark D. Hylarides, and Fred A. Mettler, Jr., both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Jun. 11, 1984, Ser. No. 619,203

Int. Cl.[4] C07C *45/65*

U.S. Cl. 568—312 23 Claims

1. In a process for deaminating an aromatic primary amine of the type wherein the amino group is diazotized to form a diazonium salt and the diazo group of the diazonium salt is replaced with a replacement group, the improvement comprising deaminating the amine in the presence of hydrogen peroxide in an amount of at least about 0.25 mol peroxide per mol of diazonium salt.

4,577,047

CATALYSTS AND PROCESS FOR THE SELECTIVE HYDROGENATION OF ACETYLENES

Henry C. Hudson, New Caney, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 675,175, Nov. 27, 1984, Pat. No. 4,551,443. This application Aug. 22, 1985, Ser. No. 768,287

Int. Cl.[4] C07C *5/03*

U.S. Cl. 585—260 28 Claims

1. A process for the selective hydrogenation of acetylenic hydrocarbon impurities in a stream comprising lower olefins which comprises contacting at a temperature ranging from about 50° C. to about 200° C. said stream with hydrogen and a catalyst comprising palladium and optionally chromium supported on a porous carrier which comprises alumina having a surface area less than about 5 m^2/g, a pore volume (Hg at 3000 psi) of between about 0.2 to about 0.5 cc/g and wherein greater than about 40% of the pore volume is contained in pores having pore diameters of greater than about 10 microns.

4,577,048

CATALYSIS OVER ACTIVATED HIGH SILICA ZEOLITES

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 581,497, Feb. 17, 1984, Pat. No. 4,530,756, which is a continuation-in-part of Ser. No. 333,370, Dec. 22, 1981, Pat. No. 4,444,902. This application May 13, 1985, Ser. No. 733,340

Int. Cl.[4] C07C *2/68, 5/22*

U.S. Cl. 585—467 25 Claims

1. A process for converting feedstock aromatic compounds selected from the group consisting of benzene, monocyclic alkyl-substituted benzene of from 7 to 10 carbon atoms and mixtures thereof, alkyl being methyl, ethyl or a combination thereof, to conversion product aromatic compounds which differ from feedstock aromatic compounds, which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a crystalline zeolite having an initial silica:alumina mole ratio of at least about 100:1 prepared by a method which comprises calcining the zeolite at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 minute to about 48 hours, contacting

said calcined zeolite with from about 0.1 to about 1 gram of solid aluminum fluoride per gram of zeolite at a temperature of from about 0° C. to about 650° C., and converting said aluminum fluoride contacted zeolite to hydrogen form.

22. The process of claim 1 wherein said feedstock aromatic compounds comprise benzene and said conversion comprises alkylation of said benzene.

23. The process of claim 1 wherein said feedstock aromatic compounds comprise toluene and said conversion comprises disproportionation of said toluene.

24. The process of claim 1 wherein said feedstock aromatic compounds comprise xylene isomers and said conversion comprises isomerization of said xylene isomers.

4,577,049

ALKYLATION OF DURENE UTILIZING HIGH BOILING CONDENSED POLYAROMATIC COMPOUNDS

Leslie R. Rudnick, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 326,469, Mar. 26, 1980, abandoned. This application Apr. 24, 1985, Ser. No. 726,572

Int. Cl.⁴ C07C *4/12*

U.S. Cl. 585—486 **6 Claims**

1. A process for the dealkylation of durene which comprises contacting durene under elevated temperatures and pressures with a polynuclear aromatic compound having a boiling point of at least 600° F., said dealkylation being carried out in the presence of a carbon molecular sieve.

4,577,050

ZSM-5/ZSM-12 CATALYST MIXTURE FOR CRACKING ALKYLBENZENES

Warren W. Kaeding, Lawrenceville, and Carol S. Lee, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

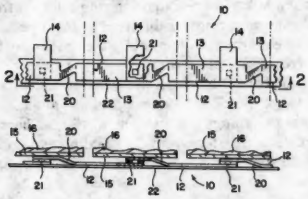
Continuation-in-part of Ser. No. 490,624, May 2, 1983, abandoned. This application Jun. 14, 1984, Ser. No. 620,590

Int. Cl.⁴ C07C *4/12*

U.S. Cl. 585—486 **6 Claims**

1. A process for converting a first hydrocarbon mixture to a second hydrocarbon mixture, said first hydrocarbon mixture consisting essentially of aromatic hydrocarbons having 10 or more carbon atoms, said first hydrocarbon mixture comprising at least 50% by weight of diisopropylbenzene and less than 5% by weight of the sum of benzene, toluene, xylene and ethylbenzene, said second hydrocarbon mixture comprising at least 30% by weight of the sum of benzene, toluene, xylene and ethylbenzene and less than 20% by weight of diisopropylbenzene, said process comprising cracking said first hydrocarbon mixture over a catalyst comprising a mixture of zeolites, said mixture of zeolites consisting essentially of from about 10% to about 90% by weight of ZSM-5, the remainder being essentially ZSM-12.

4,577,051
BYPASS DIODE ASSEMBLY FOR PHOTOVOLTAIC MODULES
Robert A. Hartman, Chagrin Falls, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio
Filed Sep. 28, 1984, Ser. No. 655,900
Int. Cl.[4] H01L *25/02*
U.S. Cl. 136—244 14 Claims

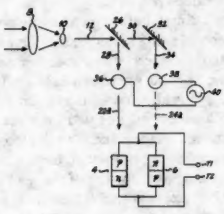


1. An apparatus for conditionally electrically bypassing a power generating segment of a photovoltaic assembly including a plurality of electrically interconnected power generating elements, said apparatus comprising:

a plurality of diodes each having two opposed terminals; and

a plurality of electrically conducting strips, each said strip including a generally planar longitudinal leg having first and second ends and a bridging arm portion joining said first and second ends, said first end of one said strip at least partially overlapping said second end of a next adjacent said strip, one of said diodes being disposed between each of said overlapping ends with each of its said terminals in electrical communication with a respective one of said overlapping ends.

4,577,052
AC SOLAR CELL
Herman P. Schutten, Milwaukee; James A. Benjamin, Waukesha, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio
Filed Sep. 23, 1982, Ser. No. 421,944
Int. Cl.[4] H02N *6/00*
U.S. Cl. 136—246 4 Claims

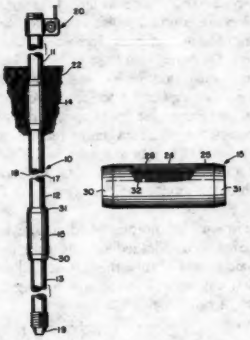


3. An AC solar cell comprising:

a pair of PN junction type solar cells connected in antiparallel between a pair of main terminals; and

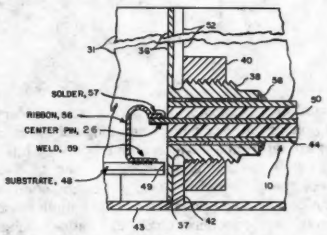
means for electrically directing light alternatingly without mechanical movement on said PN junctions to generate an alternating potential across said main terminals.

4,577,053
GROUND ROD
Anton M. Kies, Oranjelaan 8, 5062 KA Oisterwijk, Netherlands
Filed Mar. 2, 1984, Ser. No. 585,529
Int. Cl.[4] H01R *4/66*; F16B *7/18*; B21D *39/04*
U.S. Cl. 174—7 16 Claims



1. In combination, a ground rod comprising sections of copper jacketed steel rod, a coupling holding said sections in end-to-end relationship, said coupling comprising an outer sleeve of high strength corrosion resistant alloy metal and an inner sleeve of a malleable conductive metal, and means mechanically interlocking said sleeves along their co-extensive lengths, said means comprising closely spaced deformations on the interior of said corrosion resistant sleeve, said conductive metal sleeve being expanded into said deformations.

4,577,054
CONNECTING COAXIAL CABLES TO SHIELDED ELECTRONIC DEVICE
Henry M. deRonde, Lomita, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 10, 1984, Ser. No. 569,640
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 C 4 Claims



1. A combination of a coaxial cable assembly and a shielded cavity, said combination comprising:

a plurality of shielded cavity walls, said shielded cavity walls positioned about an RF electronic device therein, at least one of said shielded cavity walls having at least one vertical slot therethrough, said slot having an opening at a top of said shielded cavity wall;

a coaxial cable trough, said coaxial cable trough being adjacent to said shielded cavity wall having said vertical slot therein, said trough having a minimum width for allowing a right angle bend of a semi-rigid coaxial cable; and

a coaxial cable feed thru, said coaxial cable feed thru con-

necting a semi-rigid coaxial cable in said trough through one of said shielded cavity walls of said shielded cavity to said RF device shielded from said trough, said feed thru further comprising:

a feed thru body, said feed thru body having a flange and a threaded tube, said flange and said threaded tube are connected fixedly together, said flange and said threaded tube having aligned holes, said holes having an inside diameter slightly greater than the outside diameter of said semi-rigid coaxial cable, said semi-rigid coaxial cable soldered into said holes, said semi-rigid coaxial cable having a center conductor that protrudes beyond a surface of said flange for the purpose of connecting a conductive ribbon thereon, said flange resting on an inside surface of said shielded cavity in which said RF device is mounted and connected, said flange covering said vertical slot on said shielded cavity wall to form an RF seal thereabout; and

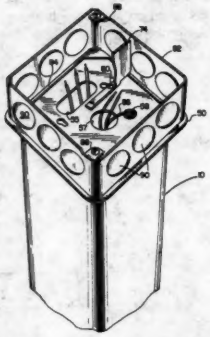
a nut, said nut for holding said flange against said inside surface of said shielded cavity, said nut being threaded onto said threaded tube that is inserted into said slot in said shielded cavity wall, such nut resting against an outside surface of said shielded cavity wall.

4,577,055

POWER POLE WIRING ASSEMBLY

Emil S. Wuertz, Madison, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jan. 16, 1984, Ser. No. 570,964
Int. Cl.⁴ H02G *3/04*
U.S. Cl. 174—48 **3 Claims**



1. A multi-purpose power hole wiring assembly for use with a power hole of the type having an elongated housing dimensioned to extend from a location above a false ceiling down to a surface below the ceiling, an elongated barrier dividing the interior volume of the housing into power and communication chambers for receiving power wires and communication wires, respectively, extending between outlet locations along the pole and the top of the pole, the housing top further comprising means having mounting openins protruding inwardly from opposite sides thereof, the wiring assembly comprising the combination of

a flat, rectangular, stiff, metal mounting plate, each side of which is significantly longer than any cross-sectional dimension of the top of the housing;

first and second mounting holes through said plate alignable with said mounting openings for receiving threaded fasteners to attach said plate to the top of said pole across the open end thereof above said ceiling;

a first wire hole through said plate for passing wires therethrough to and from said communication chamber, said first wire hole being aligned with said communication chamber when said mounting holes are aligned with said mounting openings;

a second wire hole through said plate for passing wires therethrough to and from said power chamber, said second wire hole being aligned with said power chamber when said mounting holes are aligned with said mounting openings;

a plurality of sets of threaded holes through said plate, each set being positioned to be uniquely alignable with standard mounting holes in one extension ring selected from a plurality of extension rings of different sizes to permit mounting said one extension ring on said plate to thereby form a junction box on said plate; and

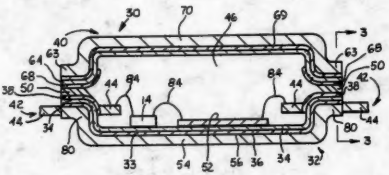
an extension barrier having a wall portion and a flange portion, said flange portion having openings alignable with said mounting openings for attachment of said barrier with the same threaded fasteners holding said plate, said wall portion being substantially aligned with the barrier in said pole.

4,577,056

HERMETICALLY SEALED METAL PACKAGE

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 9, 1984, Ser. No. 598,112
Int. Cl.⁴ H01L *23/10*
U.S. Cl. 174—52 FP **31 Claims**



1. A hermetically sealed package forming an enclosure adapted to receive an electronic device, comprising:

a first metal or metal alloy member having a first refractory oxide layer on at least a first surface thereof, said first member having at least a first metallized band on said first refractory oxide layer;

a second metal or metal alloy member disposed against said first member and being sealed to said first metallized band;

a metal or metal alloy lead frame member disposed between said first and second members, said lead frame member comprising a plurality of lead elements extending both into said enclosure being adapted for electrical connection to the electronic device and external to said enclosure, said lead frame member further having a second refractory layer on at least a portion of the lead frame surface to electrically insulate said lead frame member from said first and second members, said lead frame member further having at least a second metallized band on said second refractory oxide layer; and

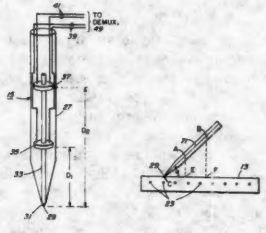
solder means for bonding said first metallized band to said second member and the second metallized band of the lead frame member between said first and second members whereby the electronic device is sealed within the enclosure.

4,577,057

DIGITIZING TABLET SYSTEM HAVING STYLUS TILT CORRECTION

Barry Blesser, Raymond, N.H., assignor to Pencept, Inc., Waltham, Mass.

Filed Mar. 2, 1984, Ser. No. 585,711
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 14 Claims



1. A digitizing tablet system comprising:

a. a housing having a two dimensional work surface for receiving a work sheet and a plurality of elements which define a rectangular coordinate grid,

b. a stylus, positioned within said rectangular coordinate grid, having a tip adapted to contact said work sheet and a pair of elements for interacting with said plurality of elements in said housing for determining the position of said tip within said rectangular coordinate grid, said pair of elements in said stylus comprising a first element disposed within said stylus at a first distance from said tip and a second element disposed within said stylus at a second distance from said tip, said second distance being different from said first distance,

c. means for energizing one of said grid of plurality of elements and said pair of elements in said stylus and producing thereby a first set of electrical output signals each having an amplitude and polarity related to the position of the first element in the pen within said rectangular coordinate grid and a second set of electrical output signals each having an amplitude and polarity related to the position of the second element in the stylus within said rectangular coordinate grid,

d. electronic means for processing the respective amplitudes and polarities of said first set of electrical output signals and said second set of electrical output signals to produce third and fourth electrical signals corresponding to the positional data of the first and second elements in the pen, respectively, relative to the grid, and

e. processing means for producing from said third and fourth electrical signals a fifth electrical signal corresponding to positional data of the tip of the stylus within said rectangular coordinate grid.

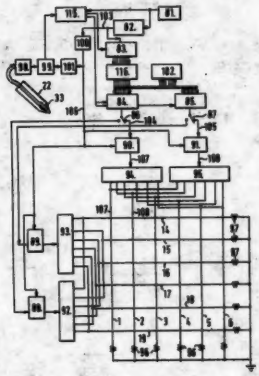
4,577,058

CURRENT-RATIO DIGITIZERS

Robert J. Collins, 36 Cannon Hill, Colehill, Wimborne, Dorset BH21 2TA, England

Filed Apr. 16, 1984, Ser. No. 600,823
Claims priority, application United Kingdom, Apr. 22, 1983, 8311043
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 18 Claims

1. A digitiser table, under the surface of which are located a set of parallel X-conductors and a set of parallel Y-conductors arranged as a grid, which may be energised by electric currents to produce patterns of magnetic field close to the surface of the table; means for applying currents of constant polarity but of varying amplitude to successive pairs of conductors in a predetermined sequence; and means movable relative to said table and having sensor means therein responsive to the local component of magnetic field perpendicular to the surface of the table; location of the sensor means between a pair of current-carrying conductors being given by the ratio of amplitudes of



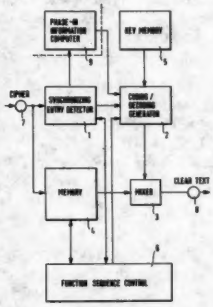
the currents applied to the two conductors of the pair when the resultant magnetic field component perpendicular to the surface of the table passes through a null value.

4,577,059

DECODING PROCESS AND APPARATUS

Kurt H. Mueller, Wallisellen, Switzerland, assignor to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Dec. 29, 1982, Ser. No. 454,414
Claims priority, application Switzerland, Jan. 29, 1982, 558/82; Apr. 2, 1982, 2046/82
Int. Cl.[4] H04K 1/02; H04L 9/02
U.S. Cl. 178—22.17 9 Claims



9. Decoding apparatus for decoding a transmitted cipher containing phase-in information recurring in time intervals in the cipher comprising detector means connected to receive said cipher for detecting phase-in information therein, means for detecting the start of receipt of the cipher, coding key sequence generator means for generating a coding key sequence which commences at a point in the sequence determined by the detected phase-in information, the coding key sequence generator being selectively operable to generate the coding key sequence in a forward or a backward direction, an intermediate memory for storing at least part of the received cipher, means for mixing the coding key sequence with the cipher stored in said memory in accordance with the proper time relationship between the received cipher and the phase-in

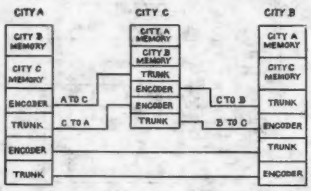
information contained in the cipher in response to the detected start of the cipher and the initial detection of the phase-in information to thereby decode the entire cipher.

4,577,060

PAGING NETWORK

Robert E. Webb, Roswell; Eugene H. Kreeft, Sugarhill, and Jack T. Arnold, Norcross, all of Ga., assignors to BBL Industries, Inc., Atlanta, Ga.

Filed May 18, 1983, Ser. No. 495,803
Int. Cl.[4] H04Q *7/04;* H04M *3/42*
U.S. Cl. 179—2 EC **34 Claims**



1. A network of paging terminals, each terminal interfacing with a telephone system and responding to telephone calls by transmitting pages in a locality serviced by said terminal, comprising:

a multi-drop communication link connected to each of said paging terminals;

means, at each of said paging terminals, for producing a message containing a page and a paging group address to identify from which of said terminals transmission of said page is desired;

means, at each of said paging terminals, for sending each of said messages on said communication link; and

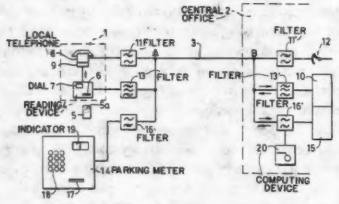
means for establishing an orderly use of said communication link by including a destination address in each of said messages to indicate to all of said paging terminals which terminal has a responsibility to send the next message on said communication link.

4,577,061

ARRANGEMENT FOR A PAY TELEPHONE PAYMENT SYSTEM UTILIZING A PAYMENT CARD WITHIN THE TELECOMMUNICATION SYSTEM

Kurt Katzeff, and Tommy Petre, both of Televerkets Huvudkontor, Fack, S-123 86 Farsta, Sweden

PCT No. PCT/SE83/00311, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/01073, PCT Pub. Date Mar. 15, 1984
PCT Filed Sep. 5, 1983, Ser. No. 609,077
Claims priority, application Sweden, Sep. 7, 1982, 8205066
Int. Cl.[4] G07F *17/24;* H04M *17/02*
U.S. Cl. 179—2 AM **3 Claims**



1. A payment system for a public telephone service and an auxiliary public service unrelated to said telephone service comprising:

a remote telephone facility adapted to be connected by a subscriber line to a telephone network central office, said remote telephone facility including:

a public telephone service facility offering telephone service in exchange or payment via a payment card comprising;

a reading device means for reading and debiting a payment card, said reading device connected to said telephone network;

a first set of telephone subsidiary devices for interfacing said reading device via said subscriber line and a central computer to said telephone network, whereby information may be transferred between said payment card and central computer identifying the identity of the payment card;

a second set of telephone subsidiary devices for interfacing said reading device via said subscriber line to communicate the residual value of the payment card to the computer facility;

a third set of telephone subsidiary devices for communicating the erasure of information on said payment card to said readng device, whereby said payment card can be debited;

an auxiliary public service facility offering services in exchange for payment via a payment card comprising:

an auxiliary reading device for reading and debiting a payment card which is issued for subscribing to said service;

first, second and third auxiliary devices for interconnecting said auxiliary reading device via said subscriber line to said central computer and transmitting the identity of an auxiliary payment card, residual value of said card and erasure information for said card;

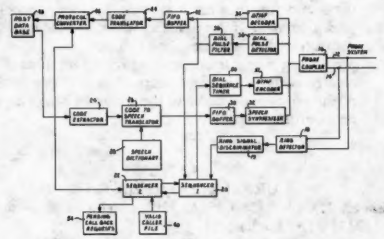
said auxiliary devices and telephone devices including filter means for maintaining signals destined for said telephone facility and auxiliary facility separate from each other.

4,577,062

METHOD FOR DISPENSING INFORMATION

Thomas N. Hilleary, Johnson County, Kans., and Robert D. Fulton, Jackson County, Mo., assignors to Butler National Corporation, Lenexa, Kans.

Filed Sep. 2, 1983, Ser. No. 529,116
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 A **7 Claims**



1. A method of automatically furnishing information through existing telephone circuits, said method comprising:

automatically receiving an incoming call and immediately automatically transmitting an invitation for the caller to enter through the caller's telephone dialing apparatus a prearranged dialing sequence identifying the caller as a recipient of the information;

automatically receiving and comparing the dialed sequence with stored data to verify the authorized status;

after verifying said status, automatically transmitting a signal to the caller inviting the entry through the caller's tele-

phone dialing apparatus of a new dialing sequence corresponding to a particular information desired;

receiving the entry made by the caller and recalling data from a changing data source corresponding to said particular information;

automatically transmitting to the caller by synthesized voice the particular information recalled from the data source;

continuing the automatic transmission of repetitive invitations to the caller to enter dialing sequences corresponding to additinal particular information, receiving the entries, recalling data corresponding to the respective particular information and automatically transmitting relevant information to the caller by synthesized voice until a predetermined time elapses after an invitation to enter is given without a subsequent entry having been made by the caller and without the caller breaking the circuit; and

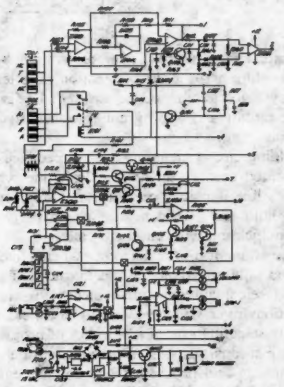
automatically transferring the call to a third telephone upon the elapse of said predetermined time interval.

4,577,063

RING DELAY OVERRIDE FOR TELEPHONE ANSWERING SYSTEM

Bradford E. Hanscom, Downey, and Gerald L. Mock, Corona, both of Calif., assignors to T.A.D. Avanti, Inc., Compton, Calif.

Filed Aug. 26, 1983, Ser. No. 526,696
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.16 **3 Claims**



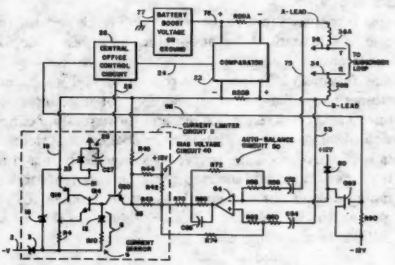
1. In a telephone answering system which responds to ring signals received over the telephone line, and which includes a magnetic tape mechanism (T-1) having a recorded announcement thereon to be transmitted over the telephone line to a caller during a time interval (T_1) in response to a predetermined number of ring signals received over the telephone line, and a magnetic tape mechanism (T-2) for recording messages received over the telephone line during a time interval (T_2) following the time interval (T_1), the combination of: a microcomputer responsive to a predetermined number of ring signals received on the telephone line to activate the system; a first input circuit coupled to the telephone line and to the microcomputer for introducing the ring signal to the microcomputer; an output circuit connected to the microcomputer to be coupled to the telephone line and to the (T-1) tape mechanism by the microcomputer upon the activation of the system by the microcomputer in response to said predetermined number of ring signals received over the telephone line to cause audio signals to be transmitted over the telephone line to a caller representing the announcement recorded on the (T-1) tape mechanism; a second input circuit connected to the microcomputer to be coupled to the telephone line and to the magnetic tape mechanism (T-2) by the microcomputer at the end of the (T_1) time interval for receiving audio signals over the telephone line during the (T_2) time interval representing a message from the caller and for causing such audio signals to be recorded on the (T-2) tape mechanism; circuit means connecting said (T-2) tape mechanism to the microcomputer for introducing pulses to the microcomputer in response to movement of the (T-2) tape mechanism; and circuitry connected to the microcomputer and controlled thereby for increasing to a second predetermined number the number of ring signals required to cause the microcomputer to activate the system in the absence of pulses being received by said microcomputer from said circuit means during a preceding (T_2) time interval.

4,577,064

AUTO-BALANCE CIRCUIT FOR BATTERY FEED IN A TELEPHONE CIRCUIT

John M. Huft, Lakewood, and Frederick J. Kiko, Aurora, both of Colo., assignors to GTE Lenkurt Incorporated, Phoenix, Ariz.

Continuation of Ser. No. 489,998, Apr. 29, 1983, abandoned.
This application Aug. 12, 1985, Ser. No. 764,518
Int. Cl.[4] H04M *19/00*
U.S. Cl. 179—16 F **8 Claims**



1. Apparatus for controlling direct current supplied from an office battery to a subscriber telephone station via tip and ring lines of a subscriber loop circuit and minimizing extraneous AC induced longitudinal voltage appearing thereon comprising:

bias means for establishing a DC reference voltage at a reference node;

differential means for detecting any AC induced longitudinal voltage on the lines, converting this AC voltage to an AC output current of said differential means, and superimposing said AC output current on said DC reference voltage at said reference node; said differential means comprising a differential input operational amplifier having inverting and non-inverting terminals electrically connected to one and other of the lines, respectively;

first means responsive to said AC current and DC reference voltage at said reference node for varying the amplitudes of both a DC output current from and an output voltage of said first means in accordance with said AC current at said reference node; and

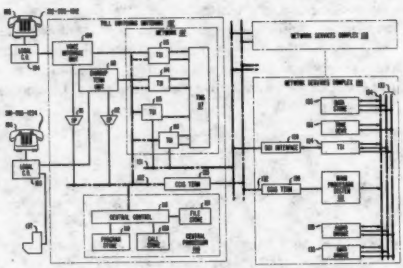
first feedback means for coupling the amplitude variation on the output voltage of said first means to an input of said differential amplifier whereby the affect of any longitudinally induced AC voltage is minimized.

4,577,065

MEET-ME CONFERENCE ARRANGEMENT

Alan E. Frey, Naperville, and Howard A. Kerr, West Chicago, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 3, 1983, Ser. No. 548,433
Int. Cl.[4] H04M *3/56*
U.S. Cl. 179—18 BC 11 Claims



1. For use in a communication network comprising a plurality of customer stations, a plurality of meet-me conference systems, communication channels and switching means for selectively interconnecting said stations to said conference systems via said communication channels, apparatus for controlling the interconnection of said stations to said conference systems comprising:

means responsive to a request for conference service from one of said stations for designating an access code for a conference,

means responsive to the initial receipt of said access code from a particular one of said stations for selecting an idle one of said conference systems and for requesting connection of said particular station to said selected system, and

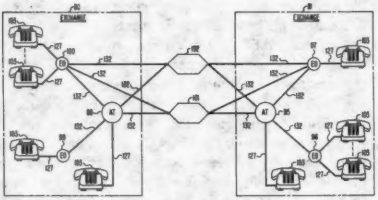
means effective upon the successful connection of said particular station to said selected conference system for designating a group of said communication channels for connecting to said selected conference system other of said stations transmitting said access code.

4,577,066

TELEPHONE INTEREXCHANGE CALL ROUTING

Brian R. Bimonte; Mark A. Gauldin, both of Wheaton, and Douglas H. Riley, Naperville, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 3, 1983, Ser. No. 519,841
Int. Cl.[4] H04M *3/42, 7/00*
U.S. Cl. 179—18 B 45 Claims



1. A method of finding a route for a telephone call, comprising the steps of:

selecting a plurality of possible call routes on the basis of a carrier designated to carry the call;

selecting one of the selected plurality of routes on the basis of characteristics associated with the call; and

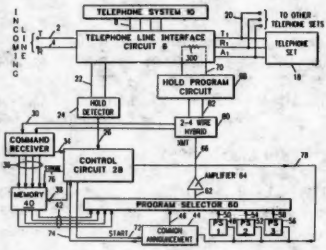
attempting to establish the selected route for the call.

4,577,067

REMOTELY CONTROLLED TELEPHONE HOLD PROGRAM SYSTEM

Alfred Levy, 12 Oak Hill Dr., Oyster Bay, N.Y. 11771, and Jon D. Paul, 2800 Third St., San Francisco, Calif. 94107

Filed Oct. 5, 1983, Ser. No. 538,820
Int. Cl.[4] H04M *11/08, 3/42*
U.S. Cl. 179—99 H 31 Claims



1. A system for providing remote program selection by a held caller during the hold connection in a telephone hold program system wherein said held caller's line is connected to a holding circuit and a program is transmitted to the held caller, comprising:

said holding circuit including hold impedance means which is shunted across said held caller's line when said held caller's line is placed on hold until said line is removed from hold and placed in use with a party available for communication with said held caller;

hold detection means for detecting when a line is being held by said hold impedance means in said holding circuit;

program select announcement means for transmitting instructions over said held line to said held caller for remotely selecting one of a plurality of programs;

switching means, responsive to said hold detection means, for causing said program select announcement means to be played over said held line to said held caller;

program select signalling means, at said held caller's location, for sending select signals over said caller's line, when said line is being held, for selecting one of a plurality of programs to be played to said held caller;

select signal decoding means for receiving and decoding said select signals sent by said held caller to select the particular program signalled by said held caller;

a plurality of program source means;

program select means, responsive to said select signal decoding means, and connected to said plurality of program source means, for selecting one of said plurality of program sources, determined by the select signal decoding means; and

hold program circuit means connected to said program select means, and responsive to said hold detection means, for coupling the selected program source to said held caller's line during the period that the held caller is on hold;

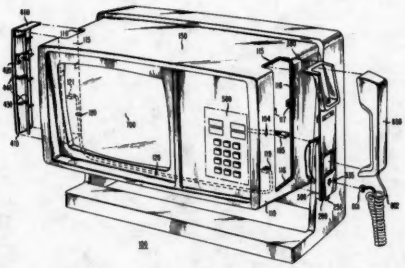
whereby the held caller will receive the program source material which said held caller has selected remotely from said plurality of program source means.

4,577,068

ADAPTIVE MODULAR TELEPHONE CRADLE FOR A COMMUNICATION TERMINAL

Thomas J. Kelly, Colts Neck, and Daniel W. Tyler, Middletown, both of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 23, 1983, Ser. No. 554,540
Int. Cl.[4] H04M *1/00*
U.S. Cl. 179—100 R 8 Claims



2. A communication terminal cabinet adapted to house a telephone station set in communication with a telephone handset, comprising at least first and second cabinet surfaces arranged in spaced-apart relationship, said first and second surfaces having respective apertures formed therein,

a modular telephone cradle adapted to receive said handset, said modular cradle being further adapted to be inserted into the aperture formed in said first surface and to be inserted into the aperture formed in said second surface, said cradle having means to establish an electrical connection between said station set and said handset, and

a modular cover plate adapted to be inserted into the aperture formed in said second surface when said modular cradle is inserted into said first surface and being further adapted to be inserted into the aperture formed in said first surface when said modular cradle is inserted into said second surface.

4,577,069

ELECTROACOUSTICAL TRANSDUCER

William J. Keezer, Medway, Mass., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 718,178, Aug. 27, 1976, Pat. No. 4,158,756. This application Jul. 7, 1978, Ser. No. 922,557
Int. Cl.[4] H04R *9/02*
U.S. Cl. 179—119 R 6 Claims

1. In an electroacoustical transducer having an annular permanent magnet with a center aperture, a pole piece positioned in the aperture, a voice coil surrounding the pole piece, a diaphragm operatively connected to the pole piece, a front flux plate with a center aperture aligned with the aperture of the magnet, a back flux plate attached to the pole piece, the improvement comprising:

at least one of said flux plates having opposite parallel faces, one of which is completely flush with the annular magnet and said one flux plate having eight sides substantially perpendicular to and between the faces, each side having an inner edge abutting the annular magnet, an outer edge substantially parallel to the inner edge, and two edges in common with adjacent sides; and

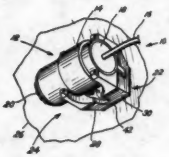
the inner face edges of the one flux plate being contained within the area bouned by the outer diameter of the annular magnet.

4,577,070

HOLDER FOR INCONSPICUOUSLY MOUNTING A MICROPHONE

Yuri Shulman, 8326 N. Keystone St., Skokie, Ill. 60076

Filed Sep. 28, 1984, Ser. No. 655,865
Int. Cl.[4] H04R *1/02;* A47D *15/00;* F16L *3/12*
U.S. Cl. 179—146 R 7 Claims



1. A holder for inconspicuously mounting a microphone comprising:

base means for securing said holder to a surface; and

cradle means for interlockingly receiving said microphone in four distinct orientations with respect to said holder, said cradle means including four struts extending from said base means, each of four struts having a bi-directional flexibility so as to snappingly receive and release said microphone.

4,577,071

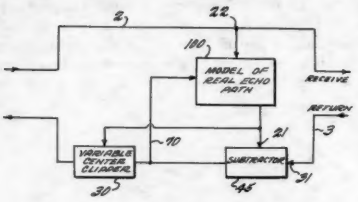
ECHO CANCELLER WITH ADAPTIVE RESIDUAL CENTER CLIPPER CONTROLLED BY ECHO ESTIMATE

Robert D. Johnston, Woodbridge, and Nicholas J. A. Forse, Ipswich, both of England, assignors to British Telecommunications, London, England

Filed Oct. 13, 1983, Ser. No. 541,654
Claims priority, application United Kingdom, Oct. 15, 1982, 8229510; Jun. 1, 1983, 8315046
Int. Cl.[4] H04B *3/20*
U.S. Cl. 179—170.2 17 Claims

16. In an echo canceller providing an echo estimate signal

and having a residual center clipper having a controlled threshold, the improvement comprising:



control means connected to control the threshold of the center clipper in response to the echo estimate signal.

4,577,072

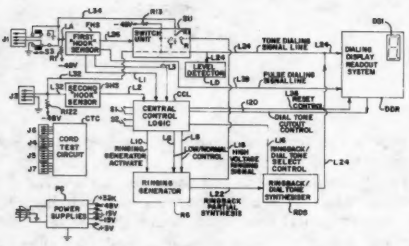
TELEPHONE EQUIPMENT TESTER

John R. Lulay, Chicago, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Dec. 30, 1983, Ser. No. 567,100

Int. Cl.[4] H04M *1/24*

U.S. Cl. 179—175.1 R **11 Claims**



1. In a plug-in telephone tester for connection to a telephone so as to test for erroneous digit-indicating dialing signals produced when manually or automatically dialing said telephone and having connector means for receiving a plug-in connector of a manual or automatically dialable telephone, a single digit indicating display element, and control means for operating said display element to display a number corresponding to each numerical digit-indicating signal received by said connector means, the improvement wherein said control means includes: first means for receiving and storing in time sequence the dialed digit-indicating signals in different storage areas thereof provided for the respective numerical digits as they are received by said connector means at possible speeds where they cannot be discerned when sequentially viewed on said display element; and second means responsive to the presence of digit-indicating signals stored in said first means for sequentially reading out the digit-indicating signals stored in said different storage areas to said signal display element to display the numerical digits involved sequentially at a slower readily visible sequential rate.

4,577,073

ELECTRICAL CIRCUIT BREAKER WITH ARC EXTINGUISHING COMPRESSED FLUID

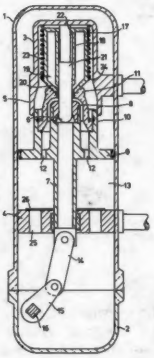
Gianpietro Talpo, Bergamo, Italy, assignor to Sace S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed Jan. 14, 1985, Ser. No. 691,015

Claims priority, application Italy, Jan. 20, 1984, 19264 A/84

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **8 Claims**



1. Electrical circuit breaker of the type using an arc extinguishing compressed fluid, in particular a gas, such as sulphur hexafluoride, comprising within a tightly sealed casing filled with the extinguishing fluid, a current bearing connector with a stationary contact, a current bearing connector in which a movable contact actuated by a driving mechanism is guided, a fluid blasting device formed by a piston solid with the movable contact and defining a compression zone, and by a fluid blasting nozzle of insulating material brought by the movable contact to an advanced position relatively to the stationary contact with an opening communicating with said compression zone, as well as a body of insulating material for the closure of the blasting nozzle, slidingly mounted for a stroke limited by a stop element on the stationary contact and under the action of elastic means, said movable body being suitable to be moved, so as to go away from said stop element by means of said nozzle during the movable contact closure stroke, characterized in that said movable body is provided with a cavity forming a chamber open towards said blasting nozzle, said chamber of the movable body being placed in communication with said compression zone through said blasting nozzle in that part of the stroke of movable contacts in which the blasting nozzle holds the movable body away from said stop element, whilst the opening of said chamber is facing the opening of the nozzle during the residual part of the stroke of movable contacts.

4,577,074

HIGH VOLTAGE GAS-BLAST CIRCUIT BREAKER

Van Doan Pham, Meyzieu, France, assignor to Alsthom-Atlantique, Paris, France

Filed Jan. 14, 1985, Ser. No. 691,042

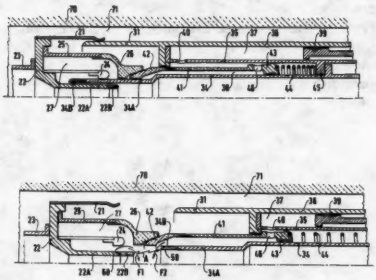
Claims priority, application France, Jan. 13, 1984, 84 00474

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**

1. Gas-blast type high voltage circuit breaker comprising means defining a first chamber wherein gas pressure increases from heating by the breaking arc, means for causing the gas in said chamber to escape said first chamber to blow out the arc at current zero of the current being interrupted, means including a piston defining a second compression gas chamber wherein gas is compressed by said piston at the beginning of the breaker opening phase and means for directing gas from

said second chamber at the arc during the following phases, main fixed contacts, fixed arcing contacts, main moving contacts and moving arcing contacts, the arc extending between the two arcing contacts during breaker opening, the



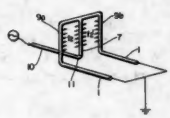
improvement wherein said first chamber and said second chamber are disposed to each side of the arcing region, are both annular-shaped and terminate in nozzles aiming separate gas jets at two respective roots of the arc.

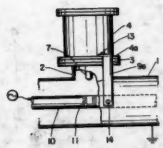
4,577,075

EARTHING SWITCH FOR GAS-INSULATED SWITCHGEAR APPARATUS

Kenji Akita; Minoru Sakaguchi, and Hiroshi Suzuyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,912
Claims priority, application Japan, Jan. 18, 1984, 59-5602
Int. Cl.[4] H01H *33/04;* H02B *1/20*
U.S. Cl. 200—148 R **7 Claims**





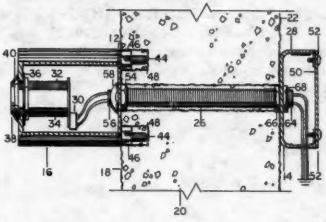
1. An earthing switch for gas-insulated switchgear apparatus comprising a gas-insulated enclosure, a main conductor disposed in said enclosure, a stationary contact provided to said main conductor, an operating mechanism case accommodating a moving contact which is movable to connect with and disconnect from said stationary contact and an operating mechanism for operating said moving contact, said case being mounted on said enclosure interposing an insulating member therebetween, and earthing means for removably providing electrical connection between said movable contact and said enclosure and including at least two earthing bars each having one end connected to said operating mechanism case and an opposite end connected to said enclosure, said two earthing bars being disposed outside of said enclosure near to said moving contact and located on opposite sides with respect to said moving contact.

4,577,076

SWITCH GUARD ASSEMBLY

Russell Whelan, Jr., 5638 Miriam Rd., Philadelphia, Pa. 19124

Filed Oct. 19, 1983, Ser. No. 543,541
Int. Cl.[4] H01H *27/00*
U.S. Cl. 200—294 **2 Claims**



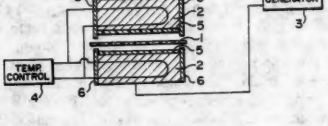
1. A switch guard assembly for mounting on a panel, said switch guard assembly comprising an outer plate and a back plate, said switch guard assembly further including a housing assembly, said panel having inner panel and outer panel faces, said outer plate and back plate being mounted respectively against said outer and inner panel faces, said outer plate being secured to said housing assembly and having an opening, said back plate being the rear wall of a standard electrical box and having an opening, said securement of said outer plate being accomplished by backwardly extending bolts which pass through appropriate openings in the outer plate, with the outer plate being secured in place by nuts threaded on said bolts, and wherein portions of said bolts and nuts are located in holes drilled in said panel, said panel having an opening communicating with the openings in said outer and back plates, a pipe having first and second ends, said pipe being located in said panel opening with said first pipe end passing through and beyond the opening in said outer plate and the second pipe end passing through and beyond the opening in said back plate, said first pipe end being firmly secured to said outer plate in a cap that is firmly secured to said first pipe end and said outer plate and said second end being firmly, but releasably, secured to said back plate, said housing assembly having in its interior, electrical switch means located in said housing and wired through said pipe and openings in said plates, said switch means being wired to a source of power, whereby the firm securement of said pipe ends to said outer plate and back plate resists removal of said housing from its position against said outer panel face, thereby further resisting access to said electrical switch means.

4,577,077

SURFACE SMOOTHING METHOD FOR DISK-LIKE RECORDING MEDIUM

Toshio Kawamata, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 26, 1983, Ser. No. 517,282
Claims priority, application Japan, Aug. 12, 1982, 57-140167
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.43 **7 Claims**



1. A method of smoothing the surfaces of a disk-like recording medium having a dielectric binder, which comprises inter-

posing and supporting the disk-like recording medium under pressure between a pair of electrodes having highly planished surfaces, and applying a high frequency from said electrodes to both surfaces of said medium so as to soften the dielectric binder, thereby smoothing the surfaces of said medium.

4,577,078

APPARATUS FOR PREHEATING MOLD RESIN FOR A SEMICONDUCTOR DEVICE

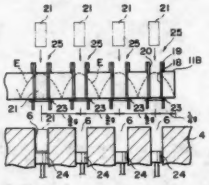
Yasumasa Noda, Kawasaki, and Yoichi Suzuki, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 30, 1984, Ser. No. 615,463

Claims priority, application Japan, May 31, 1983, 58-96026; May 31, 1983, 58-96027

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 A **12 Claims**



1. Preheating apparatus for use in a semiconductor molding apparatus for preheating mold resin before the mold resin is charged in a mold die, comprising:

a microwave generator generating a microwave;

a waveguide connected to the microwave generator;

a plurality of positioning devices respectively positioning a plurality of supplies of mold resin, within the waveguide, at the positions of peaks of the distribution, along the length of the waveguide, of the electric field intensity formed by the microwave in the waveguide, each positioning device positioning the mold resin so that the center of the mold resin coincides with the position of a peak of the distribution of the electric field intensity; and

means for permitting introduction of the mold resin from outside of the waveguide into each of the positioning devices and discharge of the mold resin from each of the positioning devices to the outside of the waveguide,

wherein walls of the waveguide perpendicular to the electric field due to the microwave are provided with perforations and each of the positioning devices comprises a cylindrical retainer extending through the waveguide and fitted in a respective one of the perforations, the inner surface of the cylindrical retainer defining a retaining hole for accommodating and positioning the mold resin.

4,577,079

DOOR OF MICROWAVE OVEN

Takamichi Sujaku, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1985, Ser. No. 726,993

Claims priority, application Japan, May 22, 1984, 59-74747[U]

Int. Cl.⁴ H05B *6/76*

U.S. Cl. 219—10.55 D **7 Claims**

1. A door for a microwave oven for opening and closing an access opening formed in a cabinet, said door comprising:

a door plate of a frame-like construction having a central window and having a forward side facing away from the opening and an inward side facing the opening;

upper and lower sashes secured to said door plate so as to cover upper and lower ends of said door plate;

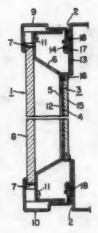
an outer barrier provided on the forward side of the door plate and arranged to cover said central window;

a screen having a front and a rear side and a number of perforations, the front side of said screen facing and covering the inward side of said central window;

a contact plate formed integrally with said screen to surround the same so that said contact plate is contactable with said cabinet at a portion surrounding said access opening,

an inner barrier provided in contact with the rear side of said screen;

a door cover engageable with said upper and lower sashes and with said contact plate and having an opening at the center;



said upper and lower sashes having at least a portion of their rearward edges which face the cabinet bent radially inwardly toward the central portion of the door to hold said door cover;

said contact plate having outer peripheral portions firstly bent toward the forward side and then bent radially outwardly thereby forming stepped portions for supporting said door cover; and

at least one pair of engaging portions provided along an internal edge of said door cover to be brought into engagement with said stepped portions of said contact plate.

4,577,080

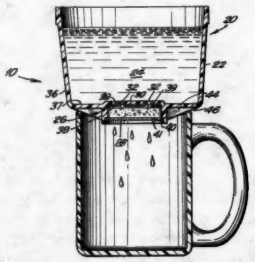
COFFEE MAKER ADAPTED FOR USE IN A MICROWAVE OVEN

M. Gary Grossman, Fort Lee, N.J., assignor to GEE Associates, Fort Lee, N.J.

Filed Mar. 19, 1985, Ser. No. 713,460

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 E **14 Claims**



1. A drip-type coffee maker adapted to discharge fresh brewed coffee into a receptacle therebelow, comprising:

a container having two compartments, including

an upper reservoir adapted to hold water,

a lower filter element adapted to hold coffee grounds and including a filter for the dispensing of brewed coffee therefrom, and

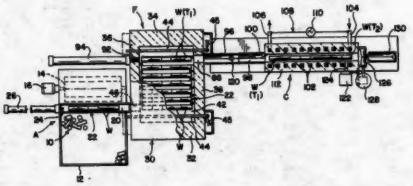
a partition between said reservoir and filter element, including at least one flow restricting perforation therethrough sealed by a non-toxic meltable substance which melts at

the temperature the water is heated for brewing coffee, whereupon the heated water will flow in a restricted manner through the perforation and the coffee grounds to become freshly brewed coffee which, in turn, will flow through said filter and into the receptacle therebelow.

4,577,081
HEATING NONMAGNETIC METAL WORKPIECES

Norbert R. Balzer, Boaz, Ala., assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Apr. 20, 1984, Ser. No. 602,542
Int. Cl.⁴ H05B *5/00, 6/64*
U.S. Cl. 219—10.69 **11 Claims**



1. The method of heating a workpiece of nonmagnetic metal material having an initial temperature to a selective elevated processing temperature comprising the steps of:

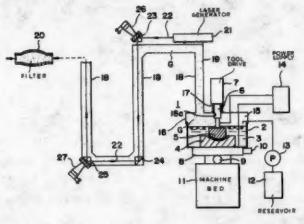
(a) first preheating the said workpiece in a high efficiency electric radiant heat furnace to a preheat temperature elevated above said initial temperature by more than one half the difference between said initial temperature and said processing temperature and said preheat temperature being substantially below said processing temperature of the workpiece so as not to cause undesired surface degradation and grain coarsening thereof, and

(b) then transferring the said preheated workpiece from said furnace immediately into and post-heating said preheated workpiece inductively in an induction heating coil to said selective processing temperature.

4,577,082
ELECTRICAL MACHINING METHOD AND APPARATUS WITH EVOLVED-GAS LASER DETOXIFICATION

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

Filed Jun. 3, 1983, Ser. No. 500,855
Claims priority, application Japan, Jun. 3, 1982, 57-95718
Int. Cl.⁴ B23H *1/10*
U.S. Cl. 219—69 D **8 Claims**



1. A method of electrically machining a conductive workpiece wherein a machining electric current is passed across a machining gap flooded with a liquid machining medium between a tool electrode and the workpiece to decompose the liquid machining medium and to erosively remove material from the conductive workpiece whereby a gaseous machining effluent comprising noxious gases is evolved from the machining gap, the method including the steps of:

collecting the effluent in a space immediately above the liquid machining medium and confining the collected effluence against direct escape into the atmosphere;

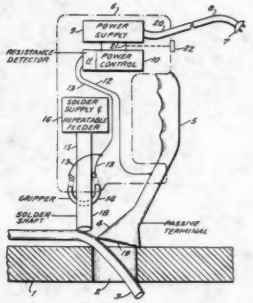
passing the collected machining effluent through an elongate fluid flow passage communicating said space with the atmosphere; and

irradiating the machining effluent flowing through said passage with a laser beam guided to pass longitudinally along said elongate fluid flow passage whereby to decompose at least a major portion of the noxious gases in said flowing machining effluent into their constituent elements.

4,577,083
SOLDERING TECHNIQUE

A. William Carreira, 166 West Remington St., Black River, N.Y. 13612

Filed Jul. 25, 1983, Ser. No. 516,808
Int. Cl.⁴ B23K *1/04*
U.S. Cl. 219—85 F **3 Claims**



1. The method of applying solder to work to be soldered comprising the steps of applying a probe to a portion of said work and applying solder to the portion of the work to be soldered, passing current through said probe, the portion of the work to be soldered and the solder in engagement therewith and thereby heating the solder until the solder has melted, the melting of the solder interrupting the passage of current and terminating the melting of the solder; the said solder when heated by the current passing therethrough constitutes the sole source of heat for melting said solder.

4,577,084
PRESSURE-DIFFERENTIAL METHOD FOR SLEEVE-TO-TUBE JOINING

Israel Stol, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 409,208, Aug. 18, 1982, Pat. No. 4,514,614. This application Dec. 28, 1984, Ser. No. 687,418
Int. Cl.⁴ B23K *1/04*
U.S. Cl. 219—85 M **9 Claims**

1. A method for brazing a metal sleeve within a metal tube comprising:

positioning a metal sleeve having brazing material on the outside thereof in a metal tube;

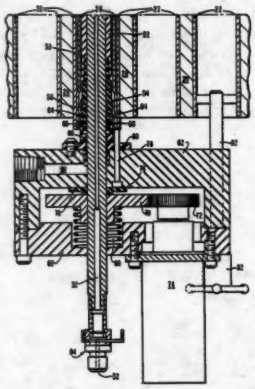
inserting a heating apparatus in said sleeve near a portion of said sleeve to be brazed to said tube;

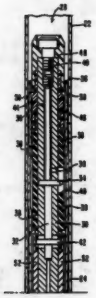
actuating a sealing mechanism of said heating apparatus thereby defining a sealed chamber between said sleeve and

said heating apparatus near said portion of said sleeve to be brazed to said tube;

introducing an inert shielding gas through said heating apparatus and into said sealed chamber for pressurizing said sealed chamber to between approximately 5 to 150 psi;

activating said heating apparatus by establishing a current of between approximately 2–150 amps through said heating





apparatus for heating said sleeve and said braze material while said shielding gas gently forces said sleeve and braze material outwardly toward said tube thereby placing said sleeve and said braze material in close contact with said tube during the brazing process; and

rotating said heating apparatus about its longitudinal axis for completing a braze joint around the circumference of said sleeve.

4,577,085

SYSTEM OF TRANSFORMERS FOR A WELDING APPARATUS

Peter H. Burgher, Howell, and John L. Boomer, Haslett, both of Mich., assignors to Marelco Power Systems, Inc., Howell, Mich.

Filed Jan. 20, 1984, Ser. No. 572,396
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—116 **11 Claims**

1. A welding system comprising:

a pair of welding electrodes,

an isolation transformer having a primary coil and a secondary coil,

means for mounting said isolation transformer closely adjacent said electrodes,

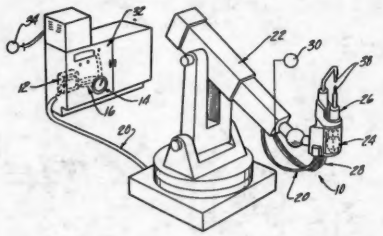
an auto transformer having a coil and a pair of taps,

means for electrically connecting said auto transformer coil taps to said isolation transformer primary coil,

a power source electrically connected to said auto transformer coil,

means for mounting said auto transformer remote from said isolation transformer,

first means for fluidly cooling said isolation transformer primary coil,



second means for fluidly cooling said isolation transformer secondary coil,

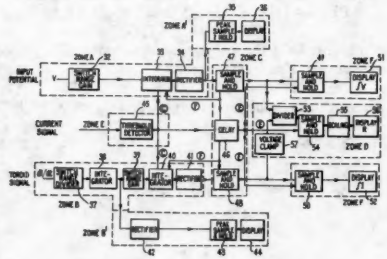
wherein said primary and secondary coils each comprise a tubular conductor and wherein said first and second cooling means comprises means for passing a fluid coolant through said isolation transformer primary and secondary coils, respectively.

4,577,086

MONITORING IN-SERVICE RESISTANCE OF AC CONDUCTORS

James C. Needham, Essex; Robert M. Rivett, Balsham, and Raymond A. G. Perryman, Newmarket, all of United Kingdom, assignors to The Welding Institute, Abington, Great Britain

Filed Sep. 9, 1983, Ser. No. 530,657
Claims priority, application United Kingdom, Sep. 10, 1982, 8225827
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—117.1 **30 Claims**



16. A method of resistance welding, the method comprising applying a current having at least an alternating component between a pair of electrodes positioned adjacent a workpiece or workpieces to be welded; and monitoring resistance characteristics of the circuit carrying the current by a method comprising:

(a) monitoring the potential drop between two predetermined positions in said circuit;

(b) monitoring said current flowing through said predetermined positions;

(c) comparing said monitored current with a threshold;

(d) determining at least two instants at which said monitored current reaches said threshold; and

(e) determining one of the integral and the average of said monitored potential drop for the period between said instants, whereby said one of the integral and the average is representative of the resistance characteristic being monitored.

4,577,087

APPARATUS FOR LASER WELDING PIPES AND THE LIKE

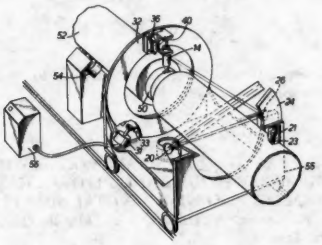
John R. Chadwick, Wilmslow, England, assignor to Fairey Engineering Limited, Stockport, England

Filed Jun. 29, 1984, Ser. No. 625,887

Claims priority, application United Kingdom, Jun. 29, 1983, 8317666

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LC **16 Claims**



1. Apparatus for directing a laser beam for laser welding pipes or like articles of circular section, said articles having an axis, said apparatus comprising a first mirror which is disposed in a position remote from said axis of said articles to be welded and on which, in use, a laser beam transmitted transverse to said axis is incident, a second mirror, a third mirror, focussing means arranged, in use, to direct said beam onto said articles to be welded substantially perpendicular to said axis of the articles, first drive means arranged to rotate said second mirror about said articles to be welded, second drive means arranged to rotate said third mirror through at least 360° about said articles to be welded and control means arranged to adjust the relative angular orientations of said mirrors such that, in use, the beam produced by said laser is reflected from said first mirror to said second mirror and thence to said third mirror and is substantially focussed by said focussing means onto said articles to be welded, whereby the focussed laser beam may be moved continously around the periphery of said articles being welded.

4,577,088

METHOD OF LASER BUTT WELDING

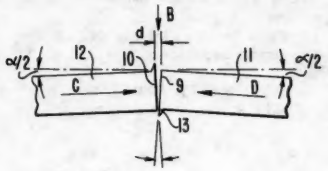
Charles M. Sharp, Landing, N.J., assignor to SWS Inc., Landing, N.J.

Filed Jun. 27, 1984, Ser. No. 625,239

Int. Cl.⁴ B23K *26/02*

U.S. Cl. 219—121 LD **20 Claims**

19. A method of forming a butt weld comprising the steps of providing two members to be butt welded, positioning respective longitudinally extending edges of said members to be butt welded in abutting contact with the edges being canted slightly with respect to one another so that the butt joint formed by said abutting edges is open toward a first side of said members in a direction transverse to the direction in which said edges longitudinally extend with said abutting edges of said butt joint contacting one another toward a second side of said members opposite said first side, and directing at least one high energy density beam at said butt joint, said beam being directed at said butt joint from said first side of said members in a direction transverse to the direction in which said edges longitudinally extend so that at least a portion of said beam extends into the



open side of said butt joint to said edges for butt welding said members.

4,577,089

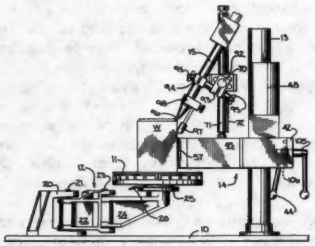
AUTOMATIC WELDING MACHINE

Gene R. Olson, 985 N. 115th St., Wauwatosa, Wis. 53226, and Gregg R. Sorenson, 605 Elm Grove Rd., Elm Grove, Wis. 53122

Continuation of Ser. No. 306,469, Sep. 28, 1981, abandoned. This application Mar. 22, 1984, Ser. No. 592,728

Int. Cl.⁴ B23K *9/225*

U.S. Cl. 219—124.22 **5 Claims**



1. A welding machine comprising:

a workpiece support table freely movable in a horizontal plane;

an upright standard adjacent said support table;

a pair of closely spaced rollers mounted in a roller housing mounted on said standard by a releasable clamp mechanism which slides about the standard so that the roller housing may be positioned vertically and angularly relative to the axis of the standard, said rollers having their axes normal to the plane of said support table, said rollers including permanent magnets which will hold the perimeter surface of a workpiece against the rollers;

a motor connected to rotate said rollers in a common direction and to thereby turn a workpiece held against said rollers;

a carriage assembly including a welding gun, said carrier assembly being supported on a column extending from said roller housing in a direction parallel to the axes of said rollers, said carriage assembly and welding gun being movable along said column in a direction normal to the axes of said rollers; and

a probe mounted with said carriage assembly and adapted to engage the perimeter of the workpiece to position the welding gun relative to the surface of the workpiece.

4,577,090

PRIMARY CABLE APPARATUS FOR ROBOT WELDING GUN

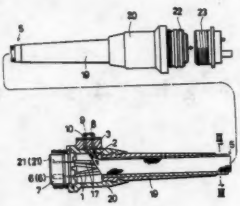
Hiroshi Obara, Tokyo, Japan, assignor to Obara Corporation, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,450

Claims priority, application Japan, Aug. 27, 1982, 57-128529[U]

Int. Cl.⁴ B23K *11/36*

U.S. Cl. 219—137.9 **4 Claims**



1. A primary cable apparatus for a robot welding gun having a cable comprising:

a pair of conductors operatively connected to a welding power source;

a grounding conductor;

a shield wire positioned to substantially surround the pair of conductors and the grounding conductor;

an insulation coating operatively positioned to substantially surround the shield wire;

a first connector operatively mounted on one end of the cable for connection to the welding power source and including terminals connected to the conductors;

a second connector for detecting a disorder having a terminal operatively connected to the grounding conductor and a terminal connected to the shield wire for detecting damage to the insulation coating of the cable; and

a disorder detector operatively connected to the terminals of the second connector by two input terminals which are thus connected to said grounding conductor and said shield wire respectively; and

circuit means connected to said input terminals and responsive to said two input terminals being at an equal potential for operating a circuit breaker interposed in a welding power circuit.

4,577,091

TRAY ELECTRODE ARRANGEMENT FOR AN ELECTRICAL STEAM OR HOT WATER GENERATOR

Albert Künzli, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 10, 1984, Ser. No. 639,336

Claims priority, application Switzerland, Aug. 11, 1983, 4388/83

Int. Cl.⁴ H05B *3/60*; F22B *1/30*

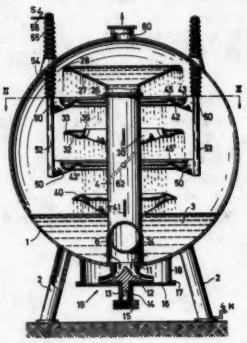
U.S. Cl. 219—284 **11 Claims**

1. An electrical hot water generator or steam generator comprising

a pressure vessel having a sump therein;

a vertical riser within said pressure vessel;

at least two pairs of spaced electrically conductive trays disposed about said riser in vertically disposed relation, said trays each having a peripheral overflow edge disposed to permit water to flow thereover in the form of a film from the top tray of the top pair of trays to the bottom tray of said top pair and then from the bottom tray of said top pair of trays to the top tray of the pair of trays therebeneath and from the bottom tray of the bottom pair of trays into said sump with said top tray of each said pair of trays being electrically insulated from said bottom tray of said respective pair of trays; and



means for conveying water from said sump to the top tray of said top pair of trays.

4,577,092

INFRARED COOKING APPARATUS WITH ADJUSTABLE HEIGHT AND PIVOTAL HEATING ELEMENT AND WITH PIVOTAL SIDE FLAPS

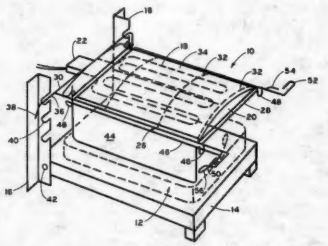
Jacques A. Lenoir, St. Hubert, 1 bis Alle de Quebec, 91300 Massy, France

Filed Jun. 6, 1983, Ser. No. 501,115

Claims priority, application France, Jun. 7, 1982, 82 09866

Int. Cl.⁴ H05B *1/00*; A47J *37/00*

U.S. Cl. 219—354 **7 Claims**



1. Cooking apparatus comprising a base for the support of a pan or the like for holding food, vertical standard means removably secured to said base and a housing substantially coextensive with said base and having a heating element located therein, said vertical standard means having detent means spaced along its length, and said housing having means enterable into and cooperating with said detent means to hang said housing on said standard in a selected one of said detent means at a selected angle to the horizontal, said housing being thus mounted on said standard means for vertical adjustment in a selected one of said detents and for selected pivotal movement about a horizontal axis corresponding to the adjusted position whereby said heating element is adjustable in use, in height and angular relationship to said base, said housing comprising an open framework in which said heating element is located and a removable cover located on said framework above the heating element provided with a reflective lower concave surface to focus the heat from said heating element inwardly from the sides of said housing and pivotal flaps removably mounted along the exterior sides of said housing, said flaps and said housing having cooperating means for selectively positioning said flaps to depend into the vertical space between said hous-

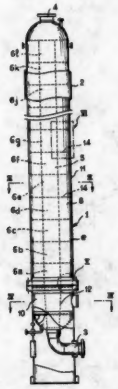
ing and the base and to permit angular adjustment of said flaps relative to said housing to provide a variable wall opening about said apparatus.

4,577,093

DEVICE FOR ELECTRIC HEATING OF A GAS MIXTURE BY DIRECT JOULE EFFECT

Christian Plard, Le Pecq, and Jacques Soulié, Paris, both of France, assignors to Electricite de France, Paris and Spie-Batignolles, Puteaux, both of France

Filed Feb. 17, 1984, Ser. No. 581,045
Claims priority, application France, Feb. 21, 1983, 83 02763
Int. Cl.⁴ F24H *3/00*
U.S. Cl. 219—376 **7 Claims**



1. A high-power device for electric heating of a gas mixture by direct Joule effect, the mixture being heated to temperatures and pressures up to 900° C. and 60 bar respectively, the device being constituted by an enclosure which has a lower inlet and an upper outlet for the gas mixture and which contains bare electric resistors and conductors for the supply of electric current to said resistors, wherein said device comprises a central duct having a lower end directly connected to said lower inlet and an upper end facing said upper outlet, said central duct being constituted by a plurality of superposed modules which are removable independently of each other, each module being constituted by a plurality of electric resistance elements made up of banks of metallic strips placed in relation, said strips being parallel to each other and to the direction along which the gas mixture flows between said inlet and said outlet of the enclosure, a peripheral zone containing the conductors for the supply of electric current to the resistance elements, and a plurality of passages formed between the central duct and the peripheral zone in order that a small proportion of the gas flow which passes through the central duct may be permitted to flow within the peripheral zone.

4,577,094

ELECTRICAL HEATING APPARATUS PROTECTED AGAINST AN OVERHEATING CONDITION

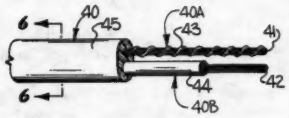
Edwin R. Mills, Wake County, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Oct. 5, 1983, Ser. No. 539,083
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—505 **29 Claims**

1. An electrical heating apparatus protected against an overheating condition and comprising

an electrical heating means for generating heat in proportion to the amount of electrical current flowing therethrough, said heating means providing essentially all of the heat for the apparatus;

a heat sensitive means in a thermally responsive relationship with respect to said electrical heating means for monitoring the heat generated by said electrical heating means and for providing a signal in response to an overheating condition, said heat sensitive means consisting of a single conductor having positive temperature coefficient electrical



impedance characteristics continuously along its entire length so that it may detect an overheating condition at any position along its entire length; and

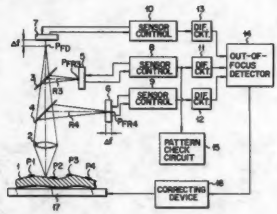
control means associated with said electrical heating means and said heat sensitive conductor for controlling the electrical current flowing through said electrical heating means in response to a signal from said heat sensitive conductor.

4,577,095

AUTOMATIC FOCUSING APPARATUS FOR A SEMICONDUCTOR PATTERN INSPECTION SYSTEM

Tomohide Watanabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 7, 1983, Ser. No. 472,604
Claims priority, application Japan, Mar. 8, 1982, 57-35260
Int. Cl.⁴ G01V *1/20*
U.S. Cl. 250—201 **6 Claims**



1. An automatic focusing apparatus for placing a semiconductor substrate into focus relative to an inspecting system so that a pattern formed on a surface of the semiconductor substrate can be inspected by the inspecting system via light emanating from the substrate to the apparatus comprising:

an objective lens disposed in opposition to the surface of the substrate having the pattern formed thereon, the objective lens having a predetermined focal length;

first and second reflection means for reflecting respective portions of the light from the surface of the substrate as refracted through the objective lens;

a first photosensitive element for receiving light reflected from said first reflection means, said first photosensitive element being positioned to receive light at the focal length of said objective lens and producing an output according to an amount of light incident upon said first photosensitive element;

a second photosensitive element for receiving light reflected from said second reflecting means, said second photosensitive element being positioned at a preselected distance closer to the focal length of said objective lens and producing an output according to an amount of light incident upon said second photosensitive element;

a third photosensitive element aligned with said objective

lens to receive light refracted therethrough, said third photosensitive element being positioned at a preselected distance farther from the objective lens than a focal length of said objective lens and producing an output according to an amount of light incident upon said third photosensitive element;

first sensing means for producing a first electrical signal based upon the output of said first photosensitive element;

second sensing means for producing a second electrical signal based upon the output of said second photosensitive element;

third sensing means for producing a third electrical signal based upon the output of said third photosensitive element;

detecting means coupled to said first, second and third sensing means for producing a focus correction signal by comparing the first, second and third electrical signals; and

correcting means coupled to said detecting means for moving the substrate relative to the objective lens in response to the focus correction signal so as to place the substrate in focus relative to the first photosensitive element;

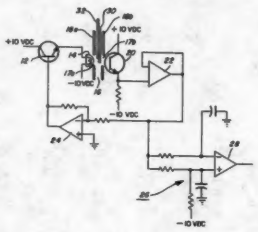
the inspecting system being coupled to said first photosensitive element for determining whether the pattern on said substrate has defects.

4,577,096

MULTIPLE COPY AND TRANSPARENCY DETECTOR WITH ILLUMINATION CONTROL

Jack Beery, Fremont, Calif.; Frederick A. Donahue, Walworth, and Ronald E. Shaul, Canandaigua, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1983, Ser. No. 523,516
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **8 Claims**



1. In a printing machine having sheets advanced through copy processing stations along a predetermined sheet path, a device for detecting superposed sheets at a sheet detection station comprising

means for feeding sheet material along the sheet path past the copying processing stations, illumination means positioned along the sheet path at the sheet detection station, a photosensitive means for receiving illumination from said illumination means, the amount of illumination received by the photosensitive means being dependent upon whether a sheet is present or not present at the sheet detection station, and

circuitry for detecting sheets in said sheet path, said circuitry comprising

feedback means electrically connected to the photosensitive means for maintaining a constant illumination from the illumination means, and

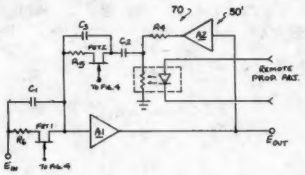
signal producing means connected to the feedback means to provide a signal in response to the stepped change in the amount of illumination received by the photosensitive means due to the presence of a copy sheet in the sheet path.

4,577,097

THREE-MODE ANALOG CONTROLLER WITH REMOTE TUNING

Marion A. Keyes, IV, Chagrin Falls; Peter K. Lui, Mentor, and Jack W. Malcolm, deceased, late of Louisville, all of Ohio (by Elizabeth J. Malcolm, executrix), assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 3, 1982, Ser. No. 414,698
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 K **9 Claims**



1. A three-mode analog controller for regulating a signal corresponding to a control variable to produce a control output comprising:

an integrating circuit for integrating the signal with a selected time constant and having a reset adjustment for varying the time constant;

a proportional circuit for applying a selected gain to the signal and having a gain adjustment for varying the gain; and

a derivative circuit for obtaining a derivative of the signal at a selected rate and having a rate adjustment for varying the rate;

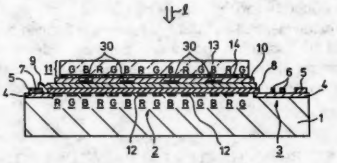
wherein said reset, gain, and rate adjustments comprise a light source, a current line connected between said signal and source for applying a current value to said light source for producing a varied light emission from said light source corresponding to said signal and a photoresistor which varies in resistance with variations in light emitted by said light source.

4,577,098

SOLID-STATE IMAGE SENSOR WITH A PHOTOTROPIC OR FLUORESCENT LAYER

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 11, 1983, Ser. No. 483,755
Claims priority, application Japan, Apr. 14, 1982, 57-62763; Apr. 16, 1982, 57-64326
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **12 Claims**



7. A solid-state image sensor comprising:

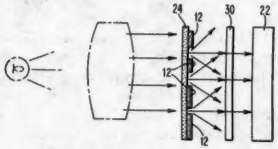
a fluorescent film disposed on a photosensor in a picture element area, the fluorescent film being transparent to green and red bands and the fluorescent film absorbing a blue cyan band and emitting a fluorescent radiation light with a wave-length longer than that of the absorbed light, said fluorescent film being disposed only between a blue or cyan filter and said photosensor.

4,577,099

APPARATUS FOR PROXIMITY DETECTION OF AN OPAQUE PATTERN ON A TRANSLUCENT SUBSTRATE

Douglas S. Goodman, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,366
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—216 9 Claims



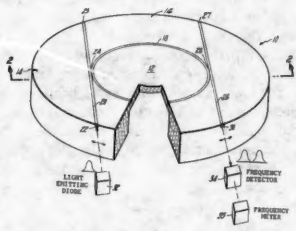
1. Improved proximity pattern detection apparatus of the type wherein an opaque pattern on a translucent background is rear illuminated and an optical pattern sensing device positioned in front of the opaque pattern responds to light transmitted through the translucent background without any intermediate imaging optics, the improvement wherein the rear illumination for the opaque pattern on the translucent background is narrow spectral band light and a narrow band pass interference filter is positioned between the opaque pattern and the optical pattern sensing device, the optical band passed by the interference filter and the spectral band of the rear illumination overlapping each other, whereby the maximum allowed spacing between the optical pattern sensing device and the opaque pattern is thereby increased for any desired optical resolution.

4,577,100

TEMPERATURE COMPENSATED OPTICAL PRESSURE SENSOR

Gerald Meltz, Avon, Conn.; Louis B. Allen, Jr., Binghamton, N.Y., and Carl M. Ferrar, East Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1983, Ser. No. 565,496
Int. Cl.[4] G01L 1/24
U.S. Cl. 250—231 P 10 Claims



1. A pressure monitor, comprising:

pressure responsive means including a diaphragm having a waveguide loop located on one surface thereof, said diaphragm deflecting under pressure to cause stress-induced birefringence in said waveguide loop;

optical input means positioned adjacent said waveguide loop for coupling light energy into said waveguide loop;

output means also positioned adjacent said waveguide loop for coupling a portion of light energy out of said waveguide loop; and

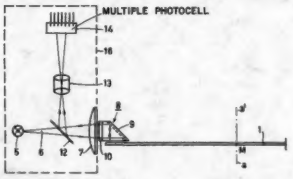
whereby a differential frequency shift occurs in the spectral response of light energy resonating in said waveguide loop as a result of said stress-induced birefringence which is proportional to pressure acting on said diaphragm.

4,577,101

SHAFT ENCODER WITH AN OPTICAL SYSTEM COMPRISING TWO STRAIGHT-LINE-GENERATRIX SURFACES

Joannes G. Bremer, Eindhoven, and Klaas Compaan, Geldrop, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1983, Ser. No. 502,079
Claims priority, application Netherlands, Jun. 8, 1982, 8202300
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE 15 Claims



1. An apparatus for determining the angular displacement of an object, comprising a measurement grating, means for mechanically connecting said grating to the object, and a radiation-sensitive detection system comprising a grating-like element,

characterized in thatthe measurement grating comprises radially extending grating strips on a circular disk, and

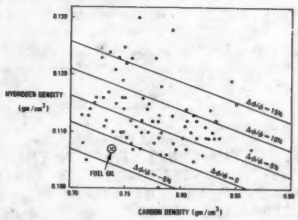
the apparatus includes an optical system comprising two straight-line-generatrix surfaces is arranged between the measurement grating and the radiation-sensitive detection system.

4,577,102

METHOD AND APPARATUS FOR DISTINGUISHING HYDROCARBON FROM FRESH WATER IN SITU

Harold Sherman, Ridgefield, and John J. Ullo, Bethel, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,881
Int. Cl.[4] G01V 5/10
U.S. Cl. 250—269 30 Claims



1. A method for investigating the oil/fresh water content of the fluid within a geological formation;

a. irradiating said geological formation with neutrons;

b. detecting the resultant neutron flux distribution and generating therefrom a first signal indicative of formation porosity;

c. deriving from said geological formation a second signal indicative of formation porosity but which is less affected by the nature of the pore fluid whether it be fresh water or liquid hydrocarbon than said first signal; and

d. comparing said first and second signals to obtain an indication of the presence of oil versus fresh water in said formation.

4,577,103

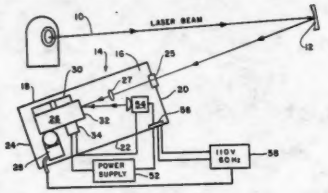
METHOD AND APPARATUS FOR HIGH SPEED, SUSTAINED RECORDING OF INFRARED LASER BEAM PATTERNS

Joseph M. Geary, Edgewood, N. Mex.; Darius S. Vunck, Redondo Beach, Calif.; Dennis C. Duneman; Ronald L. Sessions, both of Albuquerque, N. Mex.; Charles E. Moeller, and Raymond V. Wick, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 22, 1984, Ser. No. 643,138

Int. Cl.[4] G03B *42/00*; G03C *5/16*

U.S. Cl. 250—316.1 **9 Claims**



1. A method of photographically recording at high speed the far field pattern of a high energy infrared laser beam over a selected period of time for providing rapid repetitive samples of information on beam parameters such as far field beam intensity, jitter, and absolute beam size and power, said method comprising the steps of:

reflecting a sample from a high energy infrared laser beam into an enclosure that is light tight to visible radiation and contains an operating lensless movie camera loaded with a suitable film strip,

focusing the infrared beam on the film plane of the camera so that consecutive frames of the film are irradiated by the infrared beam each time the camera shutter is open, the period of irradiation being of sufficient duration to sensitize the film to visible radiation in the areas where the infrared radiation impinges on the film,

detecting the position of the camera shutter and generating electrical trigger signals just before the shutter is closed for each frame,

applying the trigger signals to appropriate circuitry that actuates a light source oriented so as to generate a pulse of visible light that irradiates the film plane of the camera near the end of each shutter movement to expose each frame of the film,

developing the film strip so exposed to provide a continuous record of the infrared laser beam characteristics over the selected period of time.

4,577,104

MEASURING THE PERCENTAGE OR FRACTIONAL MOISTURE CONTENT OF PAPER HAVING A VARIABLE INFRARED RADIATION SCATTERING CHARACTERISTIC AND CONTAINING A VARIABLE AMOUNT OF A BROADBAND INFRARED RADIATION ABSORBER

Steven P. Sturm, Columbus, Ohio, assignor to AccuRay Corporation, Columbus, Ohio

Filed Jan. 20, 1984, Ser. No. 572,361

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—339 **4 Claims**

1. A method adapted for measuring the moisture fraction or percent moisture contained in a traveling sheet of paper also containing a fiber constituent that may have a variable infrared radiation scattering characteristic and may include a variable amount of a broadband infrared radiation absorber, which method comprises

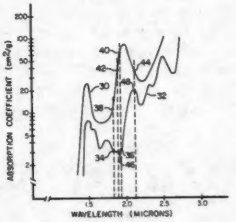
directing into the paper two sets of infrared radiation wavelengths that are affected to about the same extent by the variable scattering characteristic and are also affected to about the same extent by the variable amount of the broadband absorber,

the first set including wavelengths that have about the same absorption coefficients for the fiber constituent but have substantially different absorption coefficients for the moisture contained in the paper,

the second set including wavelengths that have about the same absorption coefficients for the moisture contained in the paper but have substantially different absorption coefficients for the fiber constituent,

detecting radiations from the paper,

forming a function of the ratio of the transmittances of the detected radiations in the first set to produce a first response to the moisture contained in the paper, the first response including a first error function dependent on the scattering characteristic and broadband absorber content of the fiber constituent,



forming a function of the ratio of the transmittances of the detected radiations in the second set to produce a second response to the fiber constituent, the second response including substantially the same first error function dependent on the scattering characteristic and broadband absorber content of the fiber constituent, the second response also including a second error function dependent on the amount of moisture contained in the paper,

forming a function of the ratio of the first and second responses to produce a third response that is substantially independent of the first error function but is dependent on the second error function, and

producing a fourth response which is a function of the third response, which is calibrated in accordance with the second error function, and which is indicative of the moisture fraction or percent moisture contained in the paper, substantially independent of the first and second error functions and substantially independent of variations of the scattering characteristic and variations in the amount of the broadband absorber.

4,577,105

METHOD OF DETERMINING MASSES OF ABSORBING COMPONENTS OF A SAMPLE IN A TEST VOLUME AND A DEVICE FOR IMPLEMENTATION OF THIS METHOD

Peter W. Krempl, and Wolfgang Schindler, both of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik and Hans List, both of Graz, Austria

Filed Apr. 20, 1984, Ser. No. 602,391

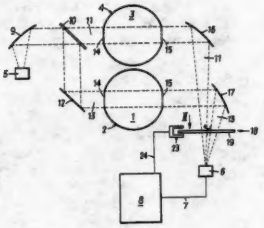
Claims priority, application Austria, Apr. 21, 1983, 1468/83

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—343 **7 Claims**

1. A method of determining masses of absorbing components of a sample in a test volume, said method including the steps of

(1) providing a test volume which contains the sample with absorbing components, (2) providing a reference volume, (3) deriving at least two frequency bands from one source of electromagnetic radiation, (4) providing a detector which has a certain response time constant, (5) passing separate beams of said electromagnetic radiation through both said test volume and said reference volume, (6) cyclically allowing said separate beams of electromagnetic radiation to alternatively pass to said



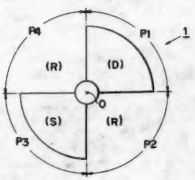
detector, said cycles being at least one order of magnitude longer than said certain response time constant of said detector, said detector, during each said cycle, detecting the intensity of each frequency band of the beam which has passed through said test volume and at least one frequency band of the beam which has passed through said reference volume, and (7) determining the masses of absorbing components of said sample based on the differences in radiation intensity detected by said detector.

4,577,106

SPECTROPHOTOMETER

Yoshiro Fukasawa; Tomoyuki Fukazawa, and Michihiro Kawamura, all of Tokyo, Japan, assignors to Japan Spectroscopic Co., Ltd., Hachioji, Japan

Filed Sep. 12, 1983, Ser. No. 531,471
Int. Cl.⁴ G01N *21/61*
U.S. Cl. 250—347 **9 Claims**



1. In a double-beam spectrophotometer comprising

means for emitting light through sample and reference cells to form sample and reference beams, respectively,

beam path switching means located in the beam paths for cyclically interrupting and switching the sample and reference beams,

a light detector for detecting a given spectrum of the beam which has passed said beam path switching means, to thereby produce an output signal, and

signal processing means for processing output signals of said light detector to determine the ratio of intensity of the sample to reference beam,

the improvement wherein

said beam path switching means is switched in its one cycle among four states:

a dark state interrupting both the sample and reference beams from passing,

a first reference beam selecting state allowing only the reference beam to pass,

a sample beam selecting state allowing only the sample beam to pass, and

a second reference beam selecting state allowing only the reference beam to pass,

in this order, and

said signal processing means includes

a signal component separating circuit for separating from each output signal of said light detector a component having a fundamental frequency corresponding to one cycle of said beam path switching means and a component having a double frequency which is twice said fundamental frequency, and

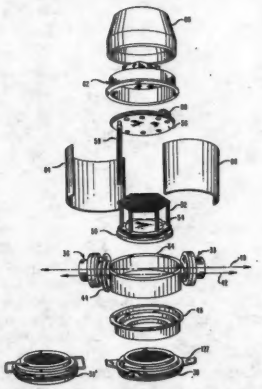
an arithmetic circuit for carrying out arithmetic operations on those signals output by said signal component separating circuit which correspond to the fundamental frequency and double frequency components.

4,577,107

DETECTOR HEAD MOUNTING APPARATUS

Raymond L. Meeder, Palos Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Continuation of Ser. No. 540,087, Oct. 7, 1983, Pat. No. 4,560,876, which is a continuation of Ser. No. 298,635, Sep. 2, 1981, Pat. No. 4,438,335. This application Sep. 6, 1984, Ser. No. 647,595
The portion of the term of this patent subsequent to Mar. 20, 2000, has been disclaimed.
Int. Cl.⁴ G01T *1/164;* G21K *1/02*
U.S. Cl. 250—363 S **10 Claims**



1. Apparatus for pivotally mounting a detector head including a collimator onto supporting structure of a radiation detector comprising

means for mounting the head onto the supporting structure for rotation about a selected one of a plurality of trunnion axes, and

means for selecting the axis about which the detector head can rotate.

4,577,108

X-RAY CONVERTER FOIL

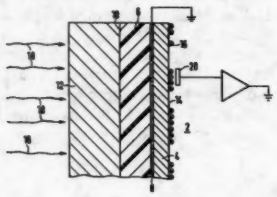
Heinrich Diepers, Höchstadt; Ingmar Feigt, Langensendelbach, and Gottfried Lange, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,223

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346477

Int. Cl.[4] G01T *1/22*

U.S. Cl. 250—370 22 Claims



1. An X-ray converter device in the form of a substantially planar sheet for detecting the intensity distribution of X-rays over a two-dimensional region, comprising:

a semiconductor layer having a thickness less than 50 μm;

an electrode in the form of an electically conductive foil attached to one face of said semiconductor layer; and

a layer attached to said conductive foil on a side thereof opposite said semiconductor layer, said layer including a carrier layer and an X-ray amplification layer.

4,577,109

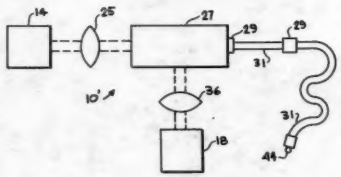
REMOTE MULTI-POSITION INFORMATION GATHERING SYSTEM AND METHOD

Tomas B. Hirschfeld, Livermore, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 194,684, Oct. 6, 1980. This application Nov. 30, 1982, Ser. No. 445,619

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—461.1 6 Claims



1. An apparatus for monitoring the salt concentration of an associated fluid and for generating a fluorescent signal related to said salt concentration, the apparatus comprising:

a fiber optic through which an illumination beam from an associated light source is transmitted from a first end of the fiber optic to a second end of the fiber optic;

a plurality of water-sensitive fluorescent indicator molecules;

a gel in contact with the associated fluid, the gel having a volume which is responsive to changes in the salt concentration of the associated fluid, and the gel holding the plurality of water-sensitive fluorescent indicator molecules adjacent to the second end of the fiber optic such that light from the illumination beam leaving the second end of the fiber optic illuminates the plurality of water-sensitive fluorescent indicator molecules and such that a portion of the fluorescent emissions generated by the plurality of water-sensitive fluorescent indicator molecules is collected by the second end of the fiber optic and transmitted to the first end of the fiber optic, the transmitted fluorescent emissions forming a fluorescent signal; and

detection means associated with the first end of the fiber optic for separating the fluorescent signal from the illumination beam and for relating the intensity of the fluorescent signal to the salt concentration of the associated fluid.

4,577,110

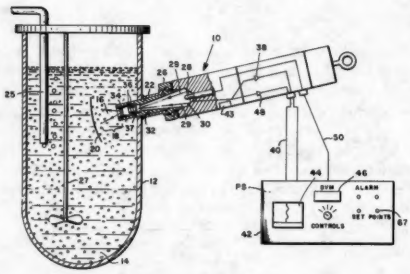
OPTICAL APPARATUS AND METHOD FOR MEASURING THE CHARACTERISTICS OF MATERIALS BY THEIR FLUORESCENCE

William R. MacBride, Glenmore; James A. Magee, Exton; William B. Armiger, King of Prussia, and Dane W. Zabriskie, West Chester, all of Pa., assignors to BioChem Sensors, Inc., Malvern, Pa.

Filed Apr. 11, 1983, Ser. No. 483,559

Int. Cl.[4] G01J *3/443;* G01N *21/64*

U.S. Cl. 250—461.2 2 Claims



1. Apparatus for measuring in real time the energy level of a liquid biological medium contained in a biological reactor, the medium containing living cells, by measuring fluorescence emitted by the cells, comprising means for projecting a directed symmetrical diverging illuminating beam of ultraviolet light along a path into the cells, and photosensitive means for detecting emitted fluorescence from within the cells, wherein the field of illumination of the illuminating beam is encompassed by the field of view of the photosensitive means detecting the emitted fluorescence and wherein at least a portion of the apparatus extends into the reactor.

4,577,111

APPARATUS FOR ELECTRON BEAM LITHOGRAPHY

Norio Saitou, Iruma; Susumu Ozasa, Kashiwa, and Takashi Matsuzaka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,091

Claims priority, application Japan, Jul. 28, 1982, 57-131476

Int. Cl.[4] H01J *37/26*

U.S. Cl. 250—492.2 6 Claims

1. An apparatus for electron beam lithography comprising:

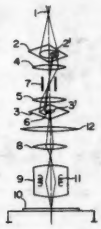
means for generating an electron beam;

first electrooptic means for shaping said electron beam to yield a desired sectional shape, said first electrooptic means including at least one mask having a polygonal aperture;

second electrooptic means for demagnifying and imaging a shaped beam produced by said first electrooptic means onto a sample face and for deflecting the shaped beam; and

third electrooptic means placed between said first and second electrooptic means for rotating and adjusting said

shaped beam, said third electrooptic means including a solenoid coil having a focal distance which is at least five



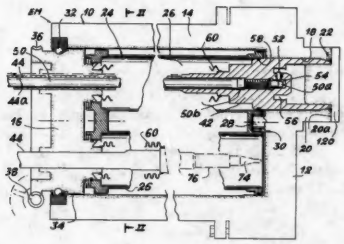
times as large as the distance between said first and second electrooptic means.

4,577,112

MOVABLE ENCLOSURE FOR THE REPLACEMENT AND TRANSPORTATION OF CONTAMINATED PARTS AND COMPLEMENTARY CASING FOR SUCH AN ENCLOSURE

Francois Conche, Les Mureaux, and Jean-Francois Montret, Verriere Le Buisson, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 5, 1984, Ser. No. 597,042
Claims priority, application France, Apr. 13, 1983, 83 06028
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—506.1 **8 Claims**



1. Apparatus for replacing and transporting contaminated parts, comprising a mobile body having front and rear ends and providing an enclosure for biological protection, said apparatus being characterized by:

A. a drum in said body which is rotatable about a rotation axis extending through the body and which defines at least two cylindrical cavities, respectively adapted to receive a contaminated part to be replaced and a new replacement part, said cavities having their axes parallel to said rotation axis and spaced at equal distances therefrom;

B. means for rotating said drum within the body so as to bring each of said cavities in turn into alignment with an opening in the front of the body;

C. a gripping head for each cavity, each said gripping head comprising

(1) a piston that is slidable axially in its cavity between a rear equipment storage position and a forward position in which the gripping head penetrates said opening, and

(2) gripping means carried by said piston for movement relative thereto between defined gripping and releasing positions;

D. said body comprising

(1) a cylindrical portion which surrounds said drum,

(2) a rear cover which is rotatably sealed to said cylindrical portion and is confined to rotation with said drum relative to said cylindrical portion, and

(3) a front base which is fixed to said cylindrical portion and in which said opening is formed;

E. an actuating rod for each gripping head, each said actuating rod being secured to the piston of its gripping head and extending coaxially rearwardly therefrom slidably through and beyond said cover to have a rear portion which projects behind said cover;

F. first actuating means cooperable with said rear portion of each actuating rod for imparting lengthwise motion thereto, for actuating the gripping head aligned with said opening between its said positions; and

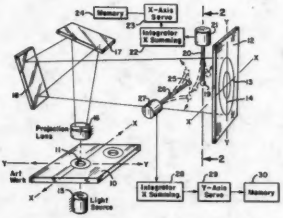
G. second actuating means receivable in an axially extending bore in each of said actuating rods for actuating said gripping means on each gripping head from one to the other of its said positions.

4,577,113

TWO AXIS CENTERING SYSTEM WITH OSCILLATING PHOTOCELLS

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

Filed May 3, 1984, Ser. No. 606,474
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—548 **4 Claims**



1. A method of positioning a member at given X and Y rectangular coordinate points, including the steps of:

(a) providing a circular hole in said member;

(b) projecting an image of said hole onto a screen having horizontal and vertical cross hairs defining X and Y axes respectively, said member being positioned at said given rectangular coordinate points when the intersection point of said cross hairs is at the exact center of said image of said circular hole;

(c) oscillating a first light responsive cell back and forth in the horizontal X axis cross hair direction;

(d) simultaneously oscillating a second light responsive cell up and down in the vertical Y axis cross hair direction, the centers of oscillations coinciding with the intersection points of said cross hairs when viewed in a direction normal to the X-Y plane;

(e) generating an X center signal whenever said first light responsive cell crosses its center of oscillation, said first light responsive cell generating a left edge signal when it crosses the left border of said image and a right edge signal when it crosses the right border of said image;

(f) utilizing said X axis center and the left and right edge signals to generate an X axis control signal having a value constituting a function of the difference in the time intervals between the X axis center signal and the left edge signal and the X axis center signal and the right edge signal so that when said time intervals are equal, said X axis control signal is zero;

(g) utilizing said X axis control signal in an X axis servo system to move said member in a direction so that the image of said hole moves along the X axis cross hair until said two time intervals are equal so that said member is positioned at said given X axis coordinate;

(h) generating a Y axis center signal whenever said second

light responsive cell crosses its center of oscillation, said second light responsive cell generating a top edge signal when it crosses the top boundary of said image and a bottom edge signal when it crosses the bottom boundary of said image;

(i) utilizing said Y axis center and the top and bottom edge signals to generate a Y axis control signal having a value constituting a function of the difference in the time intervals between the Y axis center signal and the top edge signal and the Y axis center signal and the bottom edge signal so that when said latter time intervals are equal, said Y axis center signal is zero; and,

(j) utilizing said Y axis control signal in a Y axis servo system to move said member in a direction so that the image of said hole moves along the Y axis cross hair until said latter mentioned time intervals are equal so that said member is positioned at said given Y axis coordinate.

4,577,114

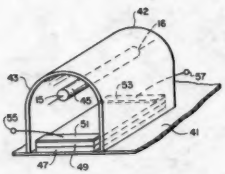
HIGH POWER OPTICAL SWITCH FOR MICROSECOND SWITCHING

Stephen Levy, Ocean; Joseph C. O'Connell, Tinton Falls; William H. Wright, Jr., Neptune, and Maurice Weiner, Ocean, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 17, 1984, Ser. No. 611,292

Int. Cl.[4] H01J *40/14;* **H01L** *31/00*

U.S. Cl. 250—551 **13 Claims**



9. A stripline type semiconductor, optically activated switch comprising; a conductive ground plane with an insulated substrate thereon, a ribbon type bulk semiconductor mounted on said substrate, a pair of metal contacts applied to the upper surface of said bulk semiconductor to define a gap therebetween, said bulk semiconductor having a tapered density of trapping centers therein with said density being maximum at said upper surface thereof, and a flashlamp mounted above said gap to provide illumination for said gap.

4,577,115

APPARATUS FOR SENSING TRANSIENT PHENOMENA IN RADIANT ENERGY IMAGES

Edward M. Rentsch, Plainsboro, and Larry A. Freedman, East Brunswick, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 8, 1982, Ser. No. 439,995

Int. Cl.[4] H01L *31/00*

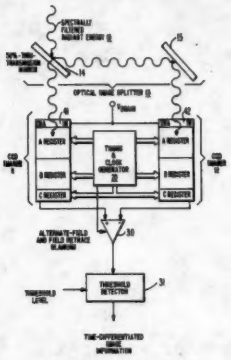
U.S. Cl. 250—578 **6 Claims**

1. A sensor system for locating transients in a radiant energy image, said sensor system comprising:

first and second CCD imagers of a field transfer type arranged to respectively receive substantially identical first and second portions of said radiant energy image in spatial registration with each other;

timing generator means supplying clocking signals to said first and second CCD imagers for causing them to sense at staggered times said first and second portions of said radiant energy image and to supply in synchronism responses to said first and second portions of said radiant energy image from successive pairs of their sensing times, the responses being supplied in synchronism according to a predetermined recurrent scan pattern relating timing to spatial location in the radiant energy image;

means for differentially combining those responses; and



means, responding to the amplitude of the differentially combined responses being too large to lie within the bounds of a range of amplitude values, for indicating the existence of a transient in the radiant energy image.

4,577,116

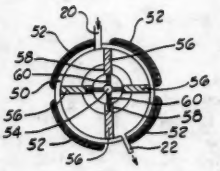
SYSTEM FOR PROVIDING ELECTRICAL ENERGY TO A MISSILE AND THE LIKE

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 14, 1983, Ser. No. 550,879

Int. Cl.[4] F01D *15/10;* **H02K** *21/12;* **H02P** *9/04*

U.S. Cl. 290—43 **4 Claims**



1. A system for providing electrical energy to a missile and the like, the system comprising:

a gas source adapted tor receipt on board the missile;

a gas regulator connected to the gas source via a gas line;

an integrated turbine driven generator having a generator housing, the housing having field coils mounted thereon, the housing also having a gas inlet connected to the gas line and a gas outlet, a turbine rotor received in the housing and having spring bias magnetic vanes slidable mounted therein and forming a positive displacement vane motor, the vanes rotating the rotor by gas expansion and the magnetic field set up therein cuts the field coils for providing an induced electrical current; and

a power regulator connected to the field coils for regulating the amount of power to the missile's electrical system.

4,577,117

LIGHT RESPONSIVE SWITCH STRUCTURE FOR USE IN A MOTOR VEHICLE OR THE LIKE

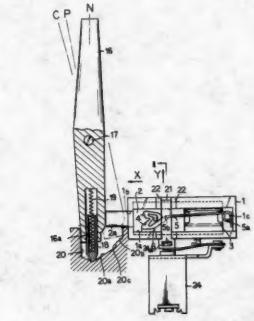
Nobuhiro Takeda; Masaichi Hattori, and Akira Hanaki, all of Aichi, Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Nishibiwajima, Japan

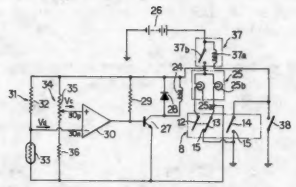
Filed Jun. 6, 1983, Ser. No. 501,493

Claims priority, application Japan, Jun. 14, 1982, 57-102795[U]; Jun. 15, 1982, 57-89133

Int. Cl.[4] H01H 3/16

U.S. Cl. 307—10 R 7 Claims





1. A dimmer switch device for use with head lamps of an automotive vehicle for automatically changing the head lamps only from high beam to low beam comprising;

(1) manually operative means (16,39) disposed for reciprocal movement between a return position (N) and an operative position (C) by manual operation and always being urged in the direction of the return position by a spring member (19);

(2) a slider (2) is moved in the direction of an operative position from a return position by said manually operative means (16) against the force of a return spring (3) within a body (1);

(3) a locking structure (6) including a grooved cam (4) formed in a surface of the slider (2) and a cam follower (5), one end of said cam follower being secured to said body, said grooved cam (4) defining an endless loop-shaped configuration and having a first engagement portion (a) for holding said manually operative means at the return position, and a second engagement portion (b) for holding said manually operative means at the operative position, each of said engagement portions being provided where the grooved cam (4) intersects with the direction of movement of said slider (2),

(4) said cam follower (5) including a spring means and a free end of which reiterates the movement around the groove of the grooved cam with the engagement with each of said engagement portions (a) and (b) and the disengagement therefrom each time said slider (2) reciprocally moves, the free end (5b) of said cam follower (5) engaging the first engagement portion (a) of the grooved cam when the slider (2) occupies the return position and engaging the second engagement portion when the slider (2) occupies the operative position;

(5) a cancelling member (21) disposed for slidable movement at one side of the body (1), said cancelling member (21) engage part of the cam follower (5) with movement in a predetermined direction only when the free end (5b) thereof occupies the second engagement portion (b) and further to disengage said free end (5b) from the second engagement portion (b), whereby the slider (2) is allowed to move in the direction of the return position by means of the spring (3);

(6) an electromagnetic solenoid (24) which moves the cancelling member (21) in said return direction when energized;

(7) an electric circuit having a photo sensing means for detecting the light from an on-coming vehicle and thereby energizing the electromagnetic solenoid (24) in response to an output of the photo sensing means in order to move the manually operative means back to the return position; and

(8) a contact structure associated with said slider, said contact structure holding the head lamp (25) at the low-beam position when the slider (2) occupies the return position (a) and holding the head lamp (25) at the high-beam position when the slider (2) occupies the operative position (b).

4,577,118

DRIVING CIRCUIT FOR PULSE CURRENT POWER SUPPLIES

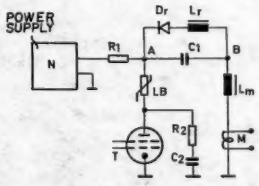
Jürgen Rümmler, Hamburg, Fed. Rep. of Germany, assignor to Deutsches Elektronen-Synchrotron Desy, Hamburg, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,530

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325502

Int. Cl.[4] H03K 3/35

U.S. Cl. 307—106 3 Claims



1. A driving circuit for pulse current power supplies with a first inductance coil as the load, said first inductance coil being connected via a first capacitor to a DC-power supply unit, with a controllable electric valve connected with its anode to a junction (A) of the first capacitor with the power supply unit, and with a recharging choke and a recharging diode connected in parallel to the first capacitor, said driving circuit comprising:

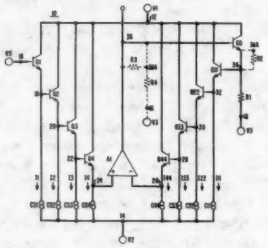
at least one ring band core surrounding the line connecting junction (A) with the anode of the electrical valve;

and further comprising a resistor and a second capacitor connected in series with said resistor so that one side of said resistor is connected to the anode of the electrical valve and the other side of the resistor is connected to the second capacitor, the other side of the second capacitor being connected to ground.

4,577,119
TRIMLESS BANDGAP REFERENCE VOLTAGE GENERATOR

Suk K. Kim, Bridgewater, N.J., and Thayamkulangara R. Viswanathan, Waterloo, Canada, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 17, 1983, Ser. No. 552,783
Int. Cl.[4] G05F 5/00
U.S. Cl. 307—297 12 Claims



1. Voltage generator circuitry comprising:

an amplifier having an output terminal and first and second differential input terminals;

a first plurality of semiconductor junctions each having an anode and a cathode, the anode of the first junction in the first plurality of junctions being connectable to a first reference voltage, and the cathode of each junction in the first plurality of junctions being coupled to the anode of the next junction in the first plurality of junctions, except that the cathode of the last junction is coupled to the first input terminal of the amplifier;

a second plurality of semiconductor junctions each having an anode and a cathode, one of the first and second pluralities of junctions containing one more junction than the other, the anode of the first junction in the second plurality of junctions being coupled to the output terminal of the amplifier, and the cathode of each of the junctions in the second plurality of junctions being coupled to the anode of the next junction in the second plurality of junctions, except that the cathode of the last junction in the second plurality of junctions is coupled to the second input terminal of the amplifier;

a first current source means coupled to a first semiconductor junction which is in the said one of the pluralities;

a second current source means coupled to the remaining junctions in the said one of the pluralities;

a third current source means coupled to all of the junctions in the other plurality.

4,577,120
Patent Not Issued For This Number

4,577,121
DIFFERENTIAL CIRCUIT

Yoshiaki Sano; Isamu Omura, and Ryo Hiramatsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

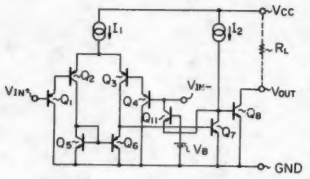
Filed Dec. 17, 1982, Ser. No. 450,763
Claims priority, application Japan, Dec. 17, 1981, 56-204317
Int. Cl.[4] H03K 5/24
U.S. Cl. 307—355 4 Claims

1. A differential circuit operatively connected to receive first and second input signals having potentials, comprising:

a differential stage having first and second transistors for receiving the first and second input signals, respectively, said differential stage comparing the potentials of the first and second input signals to provide an output corresponding to a state of said second transistor;

a control stage having a control transistor operatively connected to said differential stage, said control transistor being driven by the output of said differential stage;

an output stage including an output transistor operatively connected to said control transistor, said output transistor having a base carrying a base current, the base current of



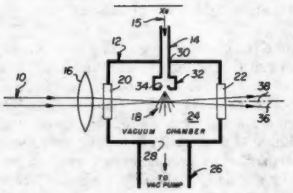
said output transistor being controlled by said control transistor; and

error-output preventing means, operatively connected between said differential stage and said control stage, including an error-output preventing transistor, said error-output preventing transistor becoming on when the potential of the second input signal becomes lower than a predetermined value, so as to keep said output transistor at a state corresponding to the relation of the potentials of the first and second input signals even if the potential of the second input signal becomes lower than the predetermined value.

4,577,122
METHOD AND APPARATUS FOR GENERATION OF COHERENT VUV AND XUV RADIATION

Andrew H. Kung, Moraga, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 28, 1983, Ser. No. 566,275
Int. Cl.[4] H03F 7/00
U.S. Cl. 307—425 18 Claims



1. A method for frequency up-converting a first beam of radiation having a selected first frequency to develop a second beam of radiation having a selected second frequency higher than said first frequency, said method comprising:

developing a plurality of successive pulsed jets of gas from a source of high pressure gas;

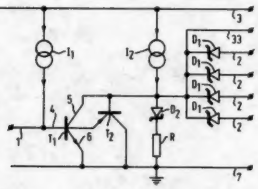
pulse modulating said first beam of radiation; and

interacting each successive pulsed jet with a corresponding beam pulse to develop said second beam.

4,577,123
INTEGRATED LOGIC CIRCUIT HAVING COLLECTOR NODE WITH PULL-UP AND CLAMP

Johannes D. P. Van Den Crommenacker, and Jan Lohstroh, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,866
Claims priority, application Netherlands, Mar. 9, 1983, 8300843
Int. Cl.⁴ H03K *19/013, 19/091, 5/08;* **H01L** *29/70*
U.S. Cl. 307—446 **7 Claims**

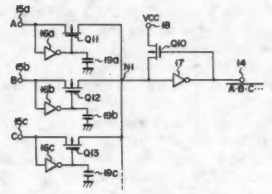


1. An integrated logic circuit having a signal input formed by a control electrode of a transistor and plural signal outputs each coupled through a diode to a first main electrode of the transistor, the signal input being connected to means for supplying current, which integrated logic circuit comprises a semiconductor body having a major surface located on an active side of the semiconductor body, a group of regions of a first conductivity type being present on this active side of the semiconductor body, which regions extend on an substrate region of a second conductivity type common to these regions, each of the regions of the first conductivity type being surrounded by an isolation zone which extends from the major surface into the semiconductor body and by means of which at least a number of these regions are isolated from each other at least during operation of the integrated logic circuit, whereby a first region of the first conductivity type belonging to the group of regions forms part of the first main electrode of the transistor and the control electrode of the transistor has a surface zone of the second conductivity type which is situated inside the isolation zone surrounding this first region, a second main electrode of the transistor adjoining the major surface and being separated from the control electrode by a rectifying junction, while at the major surface there is provided a system of signal connections which comprises conductive tracks which are separated from the semiconductor body by an insulating layer, a plurality of these conductive tracks each connecting the first region of the first conductivity type through a diode junction to a further part of the integrated logic circuit, the diode junctions constituting the said diodes which are each connected in forward direction in series with the main current path of the transistor, the means for supplying current comprising a supply line for connecting a supply source and means for supplying current from the supply line to the signal input, while a conductive connection at least comprising a load element is arranged between the supply line and the first main electrode of the transistor, characterized in that a further connection is provided, which comprises the series arrangement of a Schottky diode and a resistor and which connects the first main electrode to the second main electrode of the transistor, the further connection and the main current path of the transistor being arranged parallel to each other with the same current direction.

4,577,124
CMOS LOGIC CIRCUIT

Hideharu Koike, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 15, 1984, Ser. No. 621,085
Claims priority, application Japan, Jul. 28, 1983, 58-138319
Int. Cl.⁴ H03K *19/017, 19/094, 19/20*
U.S. Cl. 307—451 **7 Claims**

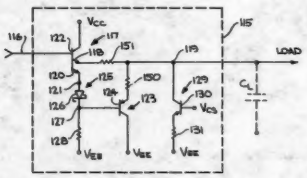


1. A CMOS logic circuit comprising:
a voltage source;
a plurality of input terminals of said CMOS logic circuit;
MOSFETs of a first conductivity type, each of which has one terminal connected to a corresponding one of said input terminals of said CMOS logic circuit, the other terminal connected to a common node, and a gate;
delaying means inserted between said input terminals of said CMOS logic circuit and the respective gates of said MOSFETs of the first conductivity type, respectively;
an output inverter having an input terminal connected to said common node of said MOSFETs of the first conductivity type, and an output terminal;
an output terminal of said CMOS logic circuit which is connected to said output terminal of said output inverter; and
a MOSFET of a second conductivity type which has one end connected to said input terminal of said output inverter, the other end connected to said voltage source, and a gate connected to said output terminal of said output inverter.

4,577,125
OUTPUT VOLTAGE DRIVER WITH TRANSIENT ACTIVE PULL-DOWN

Michael Allen, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 22, 1983, Ser. No. 564,812
Int. Cl.⁴ H03K *15/40, 19/36*
U.S. Cl. 307—455 **12 Claims**



1. An output voltage driver apparatus for a circuit for driving a load, comprising:

emitter follower means, having an input connectable to the circuit, a reference emitter node and an output emitter node for providing a reference output voltage at said reference emitter node and an output voltage at said output emitter node to drive the load, said emitter follower means providing charge-up current to the load when the output voltage swings from one level to another level;

pull-down transistor means connected to said output emitter node, for providing transient pull-down current to the load when said output voltage swings from the other level to the one level and having a bias node; and

a bias transistor matching said pull-down transistor means;

said bias transistor having a bias emitter, a bias base and a bias collector;

said bias emitter being connected to said reference emitter node; and

said bias collector and bias base being connected in common to said bias node so that said pull-down transistor means is activated to supply said transient pull-down current when said output voltage differs from the voltage at said bias node by an amount equal to or greater than a turn on voltage and said bias transistor and said pull-down transistor means behave as a current mirror during steady state to provide an essentially constant DC current during steady state to stabilize said output voltage.

4,577,126

SYNCHRONOUS ELECTRIC MACHINE WITH SUPERCONDUCTIVE FIELD WINDINGS

Alain-Jacques Mailfert, Morsang-sur-Orge, France, assignor to Institut National Polytechnique de Lorraine, Nancy, France

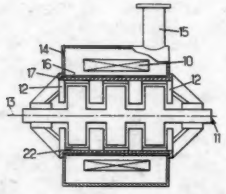
PCT No. PCT/FR82/00171, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01541, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 19, 1982, Ser. No. 525,040

Claims priority, application France, Oct. 19, 1981, 81 19620

Int. Cl.[4] H02K *9/00*

U.S. Cl. 310—52 **5 Claims**



1. A synchronous rotating electrical machine comprising, in combination:

a fixed stationary superconductive field winding adapted to provide a high intensity D.C. magnetic field having flux lines substantially parallel to an axis and a rotational symmetry about said axis in a region around said axis when a D.C. current circulates through said field winding;

a fixed normally conducting armature having a plurality of disks spaced along said axis, each disk made from an electric insulating material and having flat windings located in said region for circulation of multiphase A.C. currents;

and a rotor mounted for rotation about said axis, having a plurality of rotor disks axially interleaved with the disks of said wound armature, each said rotor disk carrying a plurality of identical ferromagnetic bodies evenly distributed angularly about said axis and located in said region for creating A.C. electromagnetic forces in said flat windings upon rotation of said rotor.

4,577,127

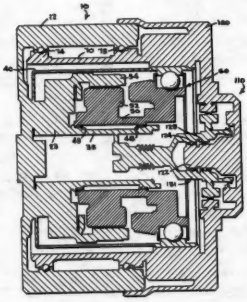
LIGHTWEIGHT ELECTRIC ROBOTIC ACTUATOR

Herbert E. Ferree, Greensburg; Thomas R. Wagner, Monroeville; Michael D. Hecht, West Mifflin, and Thomas J. Donnelly, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 563,912

Int. Cl.[4] H02K *7/06*

U.S. Cl. 310—83 **14 Claims**



1. In combination,

(a) an electric robotic actuator and a modular resolver affixed to said actuator for indicating the position of a movable portion of said actuator relative to a stationary portion of said actuator;

(b) said actuator comprising a stationary first housing, a second housing rotatably supported by said first housing, rotating means for causing said second housing to controllably rotate relative to said first housing, said rotating means comprising a motor within said housings including a stator affixed to said first housing and a rotor, said rotor coupled to said second housing through a speed reducing deep cup harmonic drive mechanism, and said second housing having a covering back plate which is provided with a centrally disposed aperture;

(c) said modular resolver comprising a first resolver portion

and a second resolver portion, said modular resolver projecting at least partially into said housings through said centrally disposed aperture in said covering back plate of said second housing, removable resolver connecting means for affixing said first resolver portion to said covering back plate of said second housing, mounting means for rotatably mounting said second resolver portion relative to said first resolver portion and for maintaining said modular resolver portions in assembled relationship, slip-fit mating means which when mated rigidly connects said second resolver portion to said stationary first housing actuator portion, said modular resolver including a resolver stator affixed to said second resolver portion and a resolver rotor affixed to said first resolver portion and operable to provide an electrical signal which is an accurate indication of the rotation of said first resolver portion relative to said second resolver portion; and said modular resolver being readily removable and replaceable on said actuator by removing said removable resolver connecting means to free said first resolver portion from said covering back plate of said second actuator housing and then moving said modular resolver out of said aperture in said covering back plate to disengage said slip-fit mating means; whereby said resolver can readily be replaced without disassembling said actuator.

4,577,128
INDUCTION MOTORS

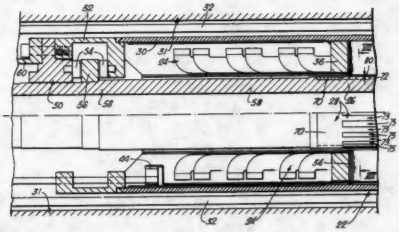
Deryk S. M. Gould, Edinburgh, and Michael T. Wright, Limekilns, both of Scotland, assignors to Northern Engineering Industries, plc, England

Continuation of Ser. No. 543,781, Oct. 20, 1983, abandoned, which is a continuation of Ser. No. 325,600, Nov. 27, 1981, abandoned. This application Jan. 7, 1985, Ser. No. 689,449

Claims priority, application United Kingdom, Dec. 11, 1980, 8039707

Int. Cl.⁴ H02K 5/12

U.S. Cl. 310—87 **4 Claims**



1. A submersible oil well pump induction motor comprising:

(a) an elongated hollow stator having windings;

(b) an elongated unitary rotor extending through said stator, said rotor comprising:

(b1) a hollow continuous tubular shaft of ferromagnetic material of substantially uniform diameter having first and second integral formations, said first formations extending lengthwise of said shaft and said second formations extending annularly of said shaft, and first and second conductors plated onto said shaft, said first conductors being elongated conductors located in said first formations and said second conductors being annular conductors located in said second formations and being in contact with said first conductors to short-circuit said first conductors,

(b2) surface portions of said rotor and of said conductors together forming a contiguous cylindrical surface facing said stator,

(b3) and a plated anti-corrosion layer applied over said contiguous cylindrical surface,

(4) the length of said rotor substantially exceeding the diameter of said rotor;

(c) first and second spaced-apart radial bearings mounted on the stator and rotatably supporting the rotor and journalled respectively on end extensions of said rotor;

(d) and a third radial bearing intermediate said first and second radial bearing and mounted on the stator and directly journaled on said plated contiguous cylindrical surface at a location intermediate said first and second bearings thereby rotatably supporting an intermediate portion of said rotor.

4,577,129
ELECTRIC MOTOR HAVING TWO CO-PLANAR STATOR SECTIONS

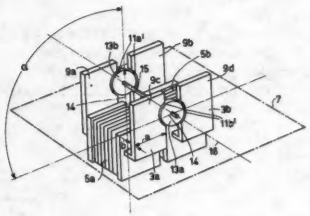
Leo Bertram, Stolberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,283

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301264

Int. Cl.⁴ H02K 7/20

U.S. Cl. 310—112 **6 Claims**



1. An electric motor having two parallel stator sections, a respective electrical excitation coil surrounding each stator section, and a rotor rotatable about a rotor axis, characterized in that

each stator section comprises an ironshank having a central part extending in a direction parallel to said rotor axis, and two respective shank parts projecting from said central part in opposite axial directions and bent to form respective poles, shank parts extending in one axial direction from said central parts forming a pair-wise juxtaposed pole shoe pair, said central parts being parallel to each other and defining a plane parallel to said rotor axis, and each pole shoe pair lying in and defining a respective plane perpendicular to said rotor axis,

each excitation coil is disposed around a respective central part and defines a coil axis parallel to said rotor axis, each coil having respective ends spaced in the axial direction,

each pole shoe is spaced from the ends of the respective coils, and each of said shank parts has a 90° bend in the area between the respective coil and the respective pole shoe pairs, and

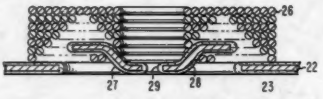
said rotor has two rotor parts on a common shaft, each rotor part having magnetic poles arranged to cooperate with a corresponding pole shoe pair, said rotor poles forming one pole set and said pole shoe pairs forming another pole set, the poles of at least one of said pole sets being angularly shifted with respect to each other, the sum of the shifts of the two pole sets being an angle of 90° maximum.

4,577,130

PANCAKE MOTOR WITH INSITU WOUND BOBBINLESS STATOR COILS

Frank R. Reed, Mt. Laurel, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 21, 1984, Ser. No. 612,428
Int. Cl.[4] H02K 3/00
U.S. Cl. 310—194 13 Claims



1. In a pancake motor of the type having a stator assembly comprising a flux return plate with stator coils mounted thereon, the improvement characterized in that:

(a) said flux return plate comprises a magnetic material having a conformal, electrically non-conducting, coating;

(b) each stator coil location on said flux return plate is provided with at least one raised tab having an offset bend, each said tab being integral with said plate; and

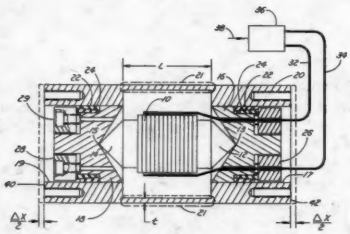
(c) each stator coil is secured to said flux return plate by entrapment of a number of turns of the coil between the tab and the surface of said flux return plate and wherein the entrapped turns are fused to the remaining turns.

4,577,131

PIEZOELECTRIC MICROMOTION ACTUATOR

James A. Soobitsky, Higganum, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Dec. 29, 1983, Ser. No. 566,686
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—328 12 Claims



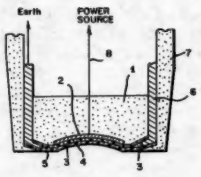
1. A micromotion actuator for transmitting in a substantially tilt free linear fashion a translation induced electrically comprising (a) a piezoelectric type transducer which expands and contracts in response to variations in an electric signal, (b) a cylindrical flexure tube in which said transducer is mounted, (c) means for coupling said transducer to said flexure tube for linearly translating at least one end of said flexure tube in a tilt-free translation on the order of at least a fraction of a wavelength of light essentially solely in a direction parallel to the longitudinal axis of said flexure tube when said transducer expands or contracts in response to variations in said electric signal while decoupling tilted or sideways motion of said transducer, and (d) means for coupling an element to be moved to at least said flexure tube one end for enabling linear displacement of said element on the order of at least a fraction of a wavelength of light in response to said tilt-free translation of said flexure tube one end; whereby accurate linear displacement of said element may be provided in response to said variations in said electric signal.

4,577,132

ULTRASONIC TRANSDUCER EMPLOYING PIEZOELECTRIC POLYMERIC MATERIAL

Hiroji Ohigashi, Zushi; Keiko Koga, Sagamihara, and Toshiharu Nakanishi, Kamakura, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 510,687, Jul. 5, 1983, which is a continuation of Ser. No. 232,963, Feb. 9, 1981, abandoned. This application Oct. 19, 1984, Ser. No. 662,946
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—800 8 Claims



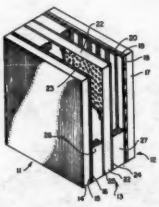
1. An ultrasonic transducer having a piezoelectric vibrating element that vibrates in a thickness extensional mode, comprising a sheet of piezoelectric material consisting essentially of a copolymer vinylidene fluoride and ethylene trifluoride, having the value of the thickness extensional electromechanical coupling factor (K_t) of at least 0.05.

4,577,133

FLAT PANEL DISPLAY AND METHOD OF MANUFACTURE

Ronald E. Wilson, 54 S. 860 E., Orem, Utah 84057

Filed Oct. 27, 1983, Ser. No. 546,103
Int. Cl.[4] H01J 31/26
U.S. Cl. 313—103 CM 28 Claims



1. A flat panel display which has an overall resolution of up to 284,000 pixels per sqare inch, said display including means for generating a low energy flow of electrons, said means including low power selection devices for gating the electron flow, said devices being energized intermittently in response to electrical signals of from 2 to 20 volts, multiplying means having a constant bias voltage for multiplying the magnitude of the electron flow, and a phospher screen for receiving the gated electron flow, the means for generating and the multiplying means and the screen being assembled in close proximity in a two-dimensional array and vacuum sealed with the multiplying means sandwiched between the means for generating and the screen.

26. A method of making an electron multiplier for a high resolution flat panel display which includes the steps of etching a multiplicity of microscopic holes having a diameter-to-length aspect on the order of 1 to 20 through at least one flat plate in a closely spaced two-dimensional array in which the holes are separated by uniform microscopic spaces to permit a hole density of up to 284,000 holes per square inch, and depositing

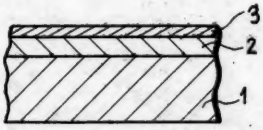
a thin layer of conductive metal on each flat surface of the plate.

4,577,134

DIRECT HEATING CATHODE AND A PROCESS FOR MANUFACTURING SAME

Guy Clerc, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 12, 1982, Ser. No. 338,872
Claims priority, application France, Jan. 16, 1981, 81 00782
Int. Cl.[4] H01J 1/14, 19/06; H01K 1/04
U.S. Cl. 313—346 R 20 Claims



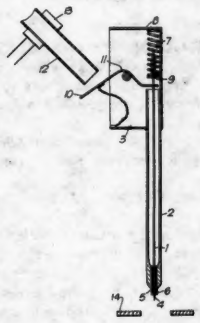
1. A cathode assembly comprising:
(a) an emissive layer comprising tungsten and at least one rare earth oxide;
(b) a layer of pyrolytic graphite supporting the emissive layer;
(c) the emissive layer coating and intimately contacting the layer of pyrolytic graphite without the presence of an intermediate layer of a diffusion barrier, and
(d) means for directly heating the support; wherein the cathode is caused to be emissive by directly heating the layer of pyrolytic graphite.

4,577,135

LIQUID METAL ION SOURCES

Derek K. Jeffries, Didcot, and Duncan J. McMillan, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 7, 1983, Ser. No. 464,677
Claims priority, application United Kingdom, Feb. 22, 1982, 8205212
Int. Cl.[4] H01J 1/02
U.S. Cl. 313—362.1 15 Claims



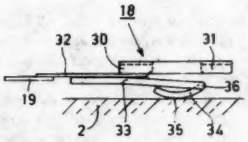
1. In an apparatus comprising a field ion emission source for the provision of ions or charged droplets of a liquid metal under the action of an applied electric field, and extraction electrode means for effecting the applied electric field, the improvement wherein said source comprises a needle having an emitting tip, a reservoir for a liquid metal, ions or charged droplets of which are to be emitted by the source, and a sheath surrounding the needle and from which the needle projects, the sheath serving to convey liquid metal to the emitting tip of the needle at a controlled rate, wherein there is provided means for withdrawing the emitting tip of the needle into the sheath so as to enable the emitting tip of the needle to be immersed in the liquid metal, thereby in use to initiate or reestablish flow of the metal over the projecting surface of the needle.

4,577,136

CATHODE-RAY TUBE HAVING A GETTERING DEVICE AND GETTERING DEVICE SUITABLE FOR SAID TUBE

Rijk Hooghordel, and Franciscus P. van Jole, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,265
Claims priority, application Netherlands, Nov. 11, 1982, 8204366
Int. Cl.[4] H01J 29/94
U.S. Cl. 313—481 6 Claims



1. In a cathode-ray tube comprising a glass envelope containing electrical components and an annular getter holder having a central opening, support means for supporting the getter holder in the envelope, said support means comprising:
(a) a resilient metal strip having a first portion connected to one of the electrical components;
(b) a metal connecting strip having a first portion connected to the getter holder and having a second portion connected to a second portion of the resilient metal strip; and
(c) a metal support arm having a first portion connected to the connecting strip at a predetermined location between said first and second portions of the strip, said support arm extending toward an inner surface of the envelope and including an end portion curved toward said inner surface, said curved end portion contacting said inner surface at a position beneath the central opening of the getter holder and spacing the getter holder at a predefined distance from the envelope;
the length of the metal support arm, from the end portion to the predetermined location of the connecting strip, and the length of the connecting strip, from said predetermined location to the first portion thereof, having predefined measurements, thereby establishing a predefined thermal conduction path length from the getter holder to the envelope;
said position of the support arm end portion, said predefined distance, and said predefined path length collectively limiting radiated and conducted heat transfer from the getter holder to the envelope during heating of the getter holder.

4,577,137

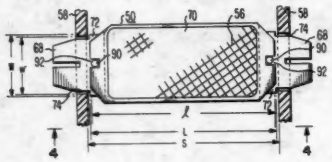
ELECTRODE STRUCTURE FOR AN ELECTRON MULTIPLIER CAGE ASSEMBLY

Donald B. Kaiser, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 18, 1984, Ser. No. 611,754
Int. Cl.[4] H01J 40/04, 43/26, 19/42
U.S. Cl. 313—533 6 Claims

1. In a photomultiplier tube comprising an evacuated envelope having therein a photoemissive cathode, a shield cup

spaced from said cathode, and an electron multiplier cage assembly abutting said shield cup, said cage assembly including a pair of transversely spaced insulating support plates having a plurality of support slots formed therethrough, said plates being attached to said shield cup, and a plurality of electrodes disposed between said support plates, said electrodes having an active portion and attachment means disposed within said support slots of said plates to support said electrodes therebetween, at least one of said electrodes having a mesh member attached thereto, the improvement comprising



said electrodes having support shoulders formed in opposite sides thereof between said active portion and said attachment means, said support shoulders having a width greater than that of said slots whereby said shoulders provide stop locations adjacent to said support plates, at least one of said electrodes including reference means and said mesh member including locating means, said locating means being aligned with said reference means of said at least one electrode.

4,577,138

THYRATRONS

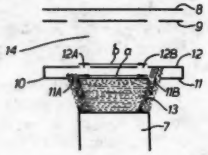
Hugh Menown, Chelmsford, and Raymond P. Knight, Braintree, both of England, assignors to English Electric Valve Company, Chelmsford, England

Filed Jul. 29, 1983, Ser. No. 518,621

Claims priority, application United Kingdom, Aug. 3, 1982, 8222374

Int. Cl.⁴ H01J *17/30*

U.S. Cl. 313—599 **9 Claims**



1. A gas-filled thyratron comprising an anode; a cathode; a control grid positioned between said anode and said cathode; and a primary grid positioned between said control grid and said cathode, said primary grid having apertures spaced in a direction from cathode to anode in at least two planes, at least one aperture in one plane being staggered relative to at least one aperture in another plane whereby to inhibit penetration through said primary grid of the primary discharge maintained between said primary grid and said cathode prior to triggering, said grids initiating but not limiting the anode current.

4,577,139

COMMUTATORLESS D.C. MOTOR WITH THREE-STRAND FULL-PITCHED STATOR WINDING

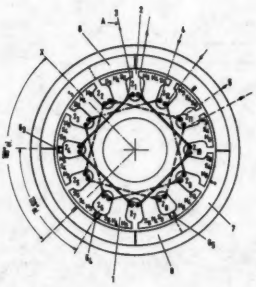
Wilhelm Reinhardt, Schrozberg, and Helmut Lipp, Hohebach, both of Fed. Rep. of Germany, assignors to EBM Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 635,050

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331194

Int. Cl.⁴ H02K *29/08*

U.S. Cl. 318—254 **4 Claims**



1. Commutatorless D.C. motor with cylindrical air gap and having a stator with three stator winding strands displaced by 120° electrical and with a permanent-magnetic external rotor with at least p=1 pairs of poles and with $N=2p\times3$ winding slots in the stator, and with at least two rotation position detectors comprising Hall generators operatively connected to switch on and off the individual winding strands depending on the rotational position of the rotor, characterized in that:

the rotor has p=2 or p=4 pairs of poles; the stator windings are full pitch and are located within the stator slots, each winding strand is subdivided into $W=2p$ winding sections, whose central axes exhibit a separation of 180° electrical, viewed in the direction of rotation, and the direction of winding of the winding sections is such that at the periphery of the stator alternating North and South poles, viewed in the direction of rotation, are produced by the winding sections.

4,577,140

APPARATUS FOR GUIDING A TRACKLESS VEHICLE

Alfred Schmidt, Munich, and Gerhard Flachenecker, Ottobrunn, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,984

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335776

Int. Cl.⁴ B64C *13/18*

U.S. Cl. 318—587 **11 Claims**

1. Apparatus for guiding a trackless vehicle along a conductor, defining a vehicle path, carrying an A.C. current, the apparatus comprising:

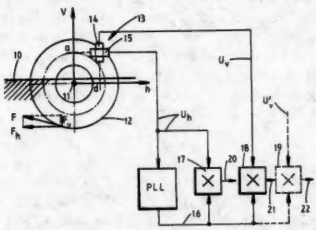
at least two sensors for detecting the magnetic field emanting from the conductor and producing output signals in response thereto, and

electronic circuitry for providing deviation signals, used to guide the vehicle, said circuitry including a phase-locked loop (PLL), the PLL including a phase-sensitive detector (PSD), a voltage-controlled oscillator (VCO), and a control unit for receiving the output of the PSD and transforming it into a control voltage, the control voltage being applied to the VCO,

the VCO generating a rectangular output signal equal to 2^n

times the frequency of the PLL, the PLL including a divider circuit for dividing the VCO output signal by 2^n, and a frequency divider for simultaneously generating a demodulation signal shifted through 90°,

means for applying the output signal of one of the sensors to the input of the PLL,



means for demodulating the output signals of the sensors, and

means for applying the output of the PLL to the demodulating means.

4,577,141

SYSTEM FOR DRIVING A MOVABLE STAGE

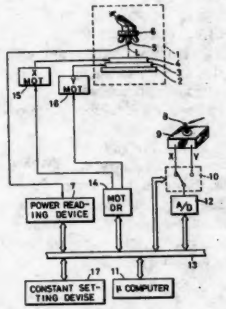
Kazuaki Saiki, Kawasaki; Aiichi Ishikawa, Minami-ashigara; Noriyoshi Hashimoto; Koichi Kudo, both of Yokohama, and Kuniyuki Yoshikawa, Fujisawa, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,323

Claims priority, application Japan, Nov. 30, 1983, 58-226344; Nov. 30, 1983, 58-226346

Int. Cl.⁴ G05B *11/18*

U.S. Cl. 318—590 **10 Claims**



1. A stage driving system having an operation lever tiltable from its neutral position in all directions and being adapted to drive a stage in two-dimensional direction depending on the direction of the tilted operation lever, said system comprising:

(a) means for detecting the angle of the tilted operation lever from its neutral position, said detecting means being adapted to generate a first signal when the angle of the tilted operation lever from its neutral position is between a first angle and a second angle larger than said first angle and to produce a second signal when the angle of the tilted operation lever from its neutral position is between said second angle and a third angle larger than said second angle; and

(b) means for moving said stage in the two-dimensional direction, said moving means being adapted to move said stage at a velocity corresponding to the angle of the tilted operation lever in response to said first signal and to move said stage under a predetermined acceleration in response to said second signal.

4,577,142

FINE FEED SYSTEM

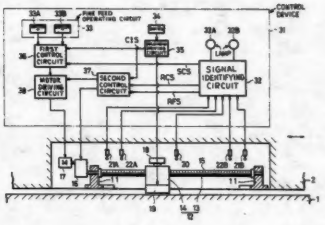
Sadayuki Matsumiya, Kawasaki, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,222

Claims priority, application Japan, Jun. 24, 1983, 58-114751

Int. Cl.⁴ G05B *11/18*

U.S. Cl. 318—592 **14 Claims**



1. A fine feed system, wherein a movable member movable relative to a stationary member is finely fed, comprising:

a fine feed mechanism, including a first member and a second member, both of which are movable relative to each other and are secured to said movable member;

a driving member operatively connected to said first member;

a clamp device operable between a clamped and released conditions and provided on said second member, said clamp device, when in said clamped condition, effecting a coupling of said second member to said stationary member;

movement regulating detector means having operable position detector elements at the ends of a range of movement for said movable member for defining a relatively movable range between said first and second members; and

a control means for effecting an operation of said driving means and a movement of said movable member within said range when said operable position detector elements of said movement regulating detector means are not operated and for operating said driving means in a direction to return said first and said second members to an original relative position in response to said clamp device being in said released condition.

4,577,143

METHOD AND APPARATUS TO CONVERT AN ELECTRICAL VALUE INTO A MECHANICAL POSITION BY USING AN ELECTROMAGNETIC ELEMENT SUBJECT TO HYSTERESIS

Gerhard Eschrich, Gerlingen; Josef Juhasz, Vaihingen, and Manfred Schwab, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,356

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336629; Mar. 3, 1984, 3407952

Int. Cl.⁴ H02P *5/28*; H01H *47/00*

U.S. Cl. 318—701 **18 Claims**

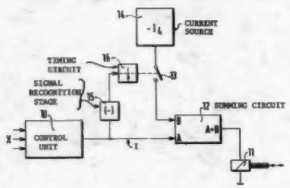
1. In an electromagnetic positioning apparatus subject to magnetic hysteresis and having a mechanical element movable among a plurality of desired positions, each corresponding to an electrical input value of said apparatus, by furnishing electrical energy to said apparatus,

wherein a characteristic plot of the value of an electrical input parameter, selected from the group consisting of

current (I) and voltage, against the value of a mechanical output parameter (n,p,s) of said apparatus, defines a rising magnetization curve (H2, 52) as said output value rises and a falling magnetization curve (H1, 51) as said output value falls, said curves defining a remagnetization hysteresis gap therebetween, and the respective values of said input and output parameters at any given time together defining an operating point (1,2,3) on one of said curves,

and wherein said hysteresis, without compensation, results, when said input value has both risen and fallen from an initial input value, in inconsistent initial and subsequent mechanical output values for the same electrical input value,

a method of compensating for the effect of said hysteresis so



as to produce a unique mechanical output value for any given electrical input value, comprising the steps of:

(a) determining whether the operating point has, due to a change in the value of said electrical input parameter, continued along the same magnetization curve, or, conversely, has undergone a change-over to the other of said curves, due to a reversal of polarity or the direction of said parameter change,

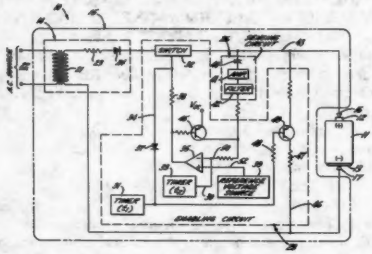
(b) if a reversal of polarity has occurred, furnishing to said electromagnetic apparatus sufficient electrical energy, not only to move said mechanical element of the electromagnetic apparatus between positions, but also to effect reversal of magnetization of the electromagnetic apparatus, to overcome the hysteresis gap between said curves (H1, 51; H2, 52).

4,577,144

BATTERY CHARGING SYSTEM INCLUDING MEANS FOR DISTINGUISHING BETWEEN RECHARGEABLE AND NON-RECHARGEABLE BATTERIES

John S. Hodgman, and Ferdinand H. Mullersman, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Oct. 11, 1984, Ser. No. 659,916
Int. Cl.⁴ H02J *7/00*
U.S. Cl. 320—2 **19 Claims**



1. A battery charging system adapted to distinguish a rechargeable battery type from a non-rechargeable battery type, both said types being of substantially similar size and having first and second external load terminals for delivering electrical energy, said system comprising, in combination:

a battery charging circuit having a first non-charging mode and a second charging mode, said circuit having first and second charging contacts arranged for engagement with the first and second external load terminals respectively of when a battery is connected to the contacts;

sensing means for sensing the value of at least one parameter common to both rechargeable and non-rechargeable batteries, said value for a rechargeable battery differing from said value for a non-rechargeable battery;

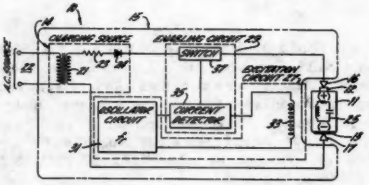
enabling means responsive to said sensing means for disabling said charging circuit when said value is indicative of a non-rechargeable battery.

4,577,145

CHARGING SYSTEM HAVING ELECTROMAGNETIC FIELD MEANS FOR DISTINGUISHING BETWEEN PRIMARY AND SECONDARY BATTERIES

Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Oct. 11, 1984, Ser. No. 659,917
Int. Cl.⁴ H02J *7/00;* **H01M** *10/44*
U.S. Cl. 320—2 **21 Claims**



1. A battery charging system adapted to distinguish a rechargeable battery type from a non-rechargeable type, both said types being of substantially similar shape and size, said system comprising, in combination:

a rechargeable battery circuit having a first non-charging mode and a second charging mode, said circuit having first and second contacts arranged for engagement with the first and second external load terminals, respectively, of said rechargeable battery;

a radiating device for radiating an electromagnetic field proximate to said battery when the battery is placed in engagement with said contacts of said charging circuit;

said rechargeable battery including indicating means responsive to the electromagnetic field for providing an indication distinguishing said rechargeable battery from a non-rechargeable battery; and

enabling means responsive to the indication from said indicating means and in response thereto enabling the charging mode of said charging circuit, whereby said charging circuit will be enabled for charging only batteries of the rechargeable type.

4,577,146

VARIABLE AUTOTRANSFORMER HAVING AN INDEXED STEPPING BRUSH

Richard S. Lenzing, Farmington, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Continuation-in-part of Ser. No. 416,718, Sep. 13, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 620,375
Int. Cl.⁴ G05F *1/14*
U.S. Cl. 323—341 **3 Claims**

1. An adjustable voltage transformer, comprising:

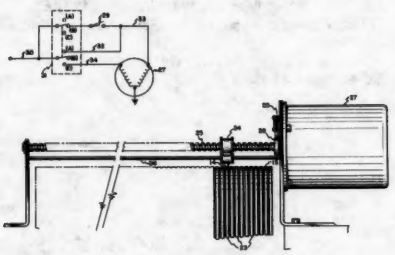
(a) an electrically conductive coil wound upon a magnetic core and

having upon the coil a commutating surface corresponding to the path of a contact brush in electrical engage-

ment therewith, the commutating surface being formed of a succession of exposed segments of the windings of the coil, and the brush being sized such that it is alternatingly in engagement with one or two of the segments;

(b) an internally threaded guide to which the brush is fixedly attached;

(c) a threaded lead screw passing through and mechanically cooperating with the guide;



(d) electric motor means to rotate the lead screw to move the guide, causing the brush to move a selected direction along the commutating surface; and

(e) control means to cause the motor means to provide rotation in the desired direction and to cause the brush to be in contact with only one segment when the brush is at rest.

4,577,147

ARRANGEMENT AND METHOD FOR VOLTAGE MEASUREMENT AT A BURIED TEST SUBJECT

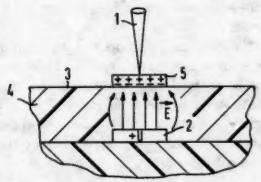
Jürgen Frosien, Ottobrunn, and Michael Pomper, Schliersee, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,088

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232671

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—71.3 **7 Claims**



1. A quantitive voltage potential measurement arrangement for use with a particle beam probe employed to measure a voltage potential on a test subject lying beneath and in direct contact with a layer and where the particle beam probe lies above a surface of the layer, comprising:

a test spot means comprising a solid state substance which has mobile charges, said test spot means being disposed in insulated fashion by said layer at said layer surface from and over said test subject and between said test subject and the particle beam probe such that the mobile charges in the test spot means are influenced by the potential on the test subject and a charge separation occurs of such mobile charges creating a potential at a surface of the test spot means facing the particle beam probe which is proportional to the voltage on the test subject, said proportional potential at the test spot means being achieved in that an area of the test spot means and the test subject are both large in comparison to a thickness of the layer beneath the test spot means so that a homogeneous electric field is present between the test spot means and the test subject when said proportional potential is present on the test spot means, and said surface potential being measured by the particle beam probe.

4,577,148

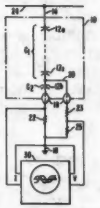
SURGE ARRESTER EQUIPPED FOR MONITORING FUNCTIONS AND METHOD OF USE

Andrew S. Sweetana, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1982, Ser. No. 450,584

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—72 **5 Claims**



1. A surge arrester equipped for monitoring functions comprising:

a plurality of arrester blocks, each comprising a metal oxide varistor, stacked in a directly connected series conductive relationship having no spark gaps;

a housing enclosing said plurality of arrester blocks;

a line terminal connected with a first of said arrester blocks and extending from said housing for connection with an AC line;

a ground terminal connected with a second of said arrester blocks remote from said first arrester block and extending from said housing for connection with an electrical ground;

a voltage tap connected to said plurality of arrester blocks at a location at least one arrester block removed from the location of said ground terminal, said voltage tap extending from said housing;

voltage indicating means connected between said voltage tap and said ground terminal and current indication means connected across a resistive shunt in series with said ground terminal.

4,577,149

DETECTION OF CATASTROPHIC FAILURE OF DIELECTRIC, IMPROPER CONNECTION, AND TEMPERATURE OF A PRINTED CIRCUIT ASSEMBLY VIA ONE WIRE

Terry B. Zbinden, Maple Grove, Minn., assignor to Sperry Corporation, New York, N.Y.

Division of Ser. No. 395,511, Jul. 6, 1982, Pat. No. 4,504,782. This application Nov. 26, 1984, Ser. No. 675,051

Int. Cl.[4] G01R *31/14;* G01N *25/00;* G08B *26/10*

U.S. Cl. 324—73 PC **6 Claims**

1. An apparatus for energizing and for sensing a selected one or more of a multiplicity of sensors as occur upon a plurality of printed circuit cards, said apparatus comprising:

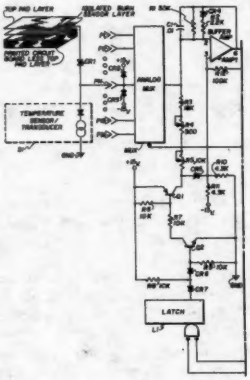
a multiplicity of wires each one of which said multiplicity of wires is connected to one or more of a multiplicity of sensors as occur upon a plurality of printed circuit cards;

voltage biasing and sensing means which are, when connected upon a time to a one of said multiplicity of wires, responsive to a selection control for upon a first selection

at a first time energizing with a first bias voltage said one of said multiplicity of wires and also said one or more of said multiplicity of sensors connected to said one of said multiplicity of wires and, simultaneously to said first time energizing, for sensing upon said one of said multiplicity of wires the signal output of a first single one of said one or more of said multiplicity of sensors connected thereto, and for upon a second selection at a second time energizing with a second bias voltage said one or more of said multiplicity of sensors connected to said one of said multiplicity of wires and, simultaneously to said second time energizing, for sensing upon said one of said multiplicity of wires the signal output of another, second, single said one or more of said multiplicity of sensors connected thereto;

selection control means responsive to an externally supplied address for providing said selection control to said voltage biasing and sensing means;

analog-signal-communicating multiplexor means responsive to an addressing signal for selectively connecting upon a time a one of said multiplicity of wires as each connect to one or more of said multiplicity of sensors as occur upon said plurality of printed circuit cards to said voltage biasing and sensing means, communicating by said selectively connecting both an analog said bias voltage signal from



said voltage biasing and sensing means to said one or more of said multiplicity of sensors as connect to said selectively connected one of said multiplicity of wires and also simultaneously an output signal of said one or more of said multiplicity of sensors to said voltage biasing and sensing means;

addressing means for receiving an externally supplied address and, responsively to said externally supplied address, providing for a time said addressing signal to said multiplexor means;

wherein said selectively connected one of said multiplicity of wires as connects to one or more of said multiplicity of sensors does in fact connect to at least both one said first sensor and one said second sensor;

wherein any single one of said multiplicity of sensors as occurs upon one of said plurality of printed circuit cards is selectable for sensing responsively to said externally supplied address because said multiplexor means, responsive to said addressing means, will selectively connect one of said multiplicity of wires to said voltage biasing and sensing means while said voltage biasing and sensing means, responsive to said selection control means, will selectively energize and sense either a first single one of said one or more of said multiplicity of sensors upon said first time, or will sense another, second, single one of said multiplicity of sensors upon said second time;

whereby when said multiplicity of wires is equal to said multiplicity of sensors then one of said multiplicity of sensors as occur upon said plurality of multilayer printed circuit cards is selectable responsively to said externally supplied address for said energizing and for said sensing.

4,577,150

PHASE MEASURING METHOD AND APPARATUS

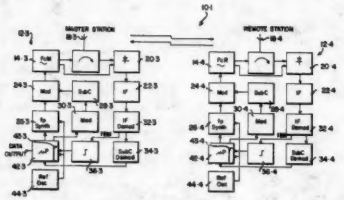
Jan Schreuder, Cape Town, South Africa, assignor to Plessey South Africa Limited, Cape Town, South Africa

Filed May 26, 1983, Ser. No. 498,467

Claims priority, application South Africa, Jun. 9, 1982, 82/4058

Int. Cl.⁴ G01R *25/00*

U.S. Cl. 324—83 R **10 Claims**



1. A method of obtaining a primary measurement of the differences in the phase relationship between a pair of comparison signals at predetermined different times, the two comparison signals existing simultaneously and having the same comparison frequency, a first of the comparison signals being produced at a first station and a second of the comparison signals being produced at a second station spaced from the first station, which method comprises:

generating at the first station a first frequency-stable reference signal having a first reference frequency suitably close to the comparison frequency;

generating at the second station a second frequency-stable reference signal having a second reference frequency suitably close to the comparison frequency;

measuring at the first station the phase relationship between the first comparison signal and the first reference signal at each of said predetermined times to provide a first secondary measurement;

measuring at the second station the phase relationship between the second comparison signal and the second reference signal at each of said predetermined times to provide a second secondary measurement; and

bringing together and suitably processing the first and second secondary measurements to extract therefrom said primary measurement.

4,577,151

SPARK MONITOR DEVICE FOR CURRENT COLLECTORS

Satoshi Tanisaka, Nagasaki, and Yoshihiro Michiguchi, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,047

Claims priority, application Japan, Jul. 14, 1981, 56-108822

Int. Cl.⁴ G01R *31/02*; G08B *21/00*

U.S. Cl. 324—158 MG **8 Claims**

1. A device for monitoring sparks generated at a current collector in a rotary machine comprising:

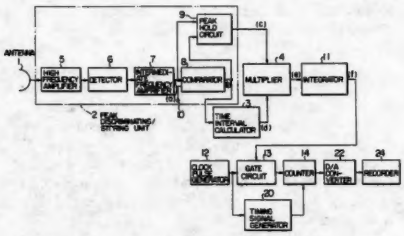
means for receiving high frequency noise derived from sparks generated at the current collector and producing a first signal corresponding to an amplitude modulating component detected from said high frequency noise;

means connected to said high frequency noise receiving means for detecting a higher level portion of said first

signal where said first signal continuously exceeds a predetermined set value;

means coupled to said higher-level portion detecting means for determining a time interval during which said higher-level portion continues; and

means connected to said higher-level portion detecting means and to said time interval determining means for generating a second signal of a level corresponding to a multiplication product of a maximum value in said higher-level portion of said first signal and said time interval determined by said time interval determining means, said second signal being representative of the state of the generated sparks.



4,577,152

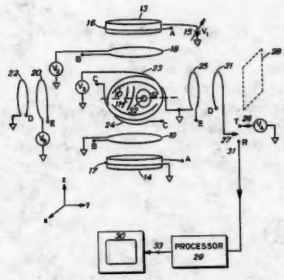
SELECTIVE MATERIAL PROJECTION IMAGING SYSTEM USING NUCLEAR MAGNETIC RESONANCE

Albert Macovski, 2505 Alpine Way, Menlo Park, Calif. 94025

Filed Apr. 11, 1983, Ser. No. 483,827

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **37 Claims**



1. In a method for producing selective material projection images of a volume using nuclear magnetic resonance the steps of:

measuring the two-dimensional projection of a plurality of components of the nuclear magnetic resonance activity using different intensities of the main magnetic field; and

processing these components to produce one or more two-dimensional projection images of specific materials of the volume.

4,577,153

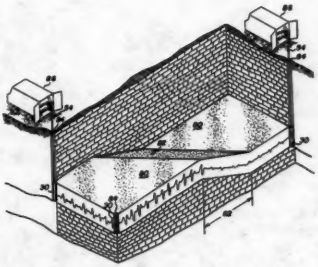
CONTINUOUS WAVE MEDIUM FREQUENCY SIGNAL TRANSMISSION SURVEY PROCEDURE FOR IMAGING STRUCTURE IN COAL SEAMS

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Continuation-in-part of Ser. No. 483,264, Apr. 8, 1983, abandoned. This application May 6, 1985, Ser. No. 731,741

Int. Cl.[4] G01V *3/12, 3/30*

U.S. Cl. 324—334 **20 Claims**



1. A method for detecting geological anomalies in underground coal seam formations comprising

placing an FM transmitter having continuous wave transmit capabilities in a medium frequency range of between approximately 300 KHz to approximately 800 KHz about a coal seam to be analyzed, the transmitter including a tuned-loop antenna for propagation through said seam;

placing a medium frequency FM receiver having continuous wave receive capability and including a tuned-loop antenna about said seam remote from the position of the transmitter with said seam intermediate to the transmitter and receiver, said tuned-loop antennas of the receiver and transmitter being positioned to be vertical to said seam, said receiver further including measuring and recording means for measuring and recording a plurality of characteristics of said received waves propagated through said seam;

exposing said seam to a plurality of transmissions of continuous wave medium frequency waves with an azimuthal magnetic field component propagated horizontally through said seam from the transmitter towards the receiver;

measuring a plurality of signal transmission characteristics through said seam;

generating a number of data points by locating both the transmitter and receiver at several points about said seam such that for each transmitter location the receiver is placed at a plurality of preselected points about said seam;

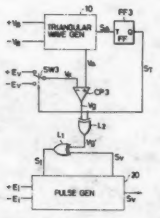
calculating a plurality of expected signal transmission characteristics through said seam; and

comparing said calculated signal transmission characteristics with said measured signal transmission characteristics and generating a graphical representation of said formation therefrom.

4,577,154
PULSE WIDTH MODULATION CIRCUIT AND INTEGRATION CIRCUIT OF ANALOG PRODUCT USING SAID MODULATION CIRCUIT

Katsuaki Takagi, Hachioji; Yuzo Kita, Fuchu; Yoshimune Hagiwara; Kazuyoshi Ogawa, both of Kodaira, and Hideo Hara, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Micro Computer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,407
Claims priority, application Japan, Jul. 28, 1982, 57-130336
Int. Cl.[4] H03K *5/05, 7/08*
U.S. Cl. 328—158 **15 Claims**

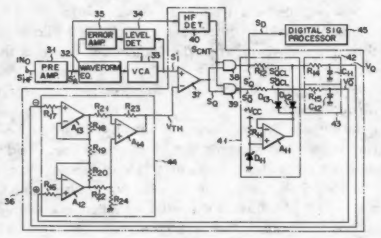


1. A pulse width modulation circuit comprising:
signal generation means for generating a triangular wave signal having a predetermined frequency;
clock signal generation means connected to receive the output of said signal generation means for generating a clock signal taking alternately first and second values in a predetermined period in synchronism with said triangular wave signal;
switch means for providing an output signal changing over between an analog signal to be used for pulse width modulation and a signal which is the inverted form of said analog signal in response to said clock signal;
comparison means for comparing said triangular wave signal and the output signals of said switch means to generate a binary output signal; and
inversion means for selectively inverting the output of said comparison means in response to said clock signal.

4,577,155
DATA EXTRACTING CIRCUIT

Akira Kobayashi, Yokohama, and Tadashi Kojima, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 15, 1983, Ser. No. 532,514
Claims priority, application Japan, Sep. 16, 1982, 57-161215
Int. Cl.[4] H03K *5/08, 5/153*
U.S. Cl. 328—164 **2 Claims**

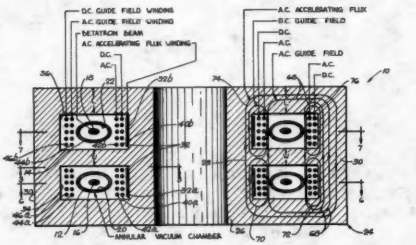


1. A data extracting circuit for converting an analog signal derived from a D.C. component-free modulated digital signal stored on a recording medium, into a D.C. component-free digital signal, comprising:
comparator means for comparing said analog signal with a reference signal and providing a compared signal;
phase inverting means for receiving said compared signal and providing a first signal component which is in-phase with said compared signal, and a second signal component which is phase-inverted with respect to said compared signal, said D.C. component-free digital signal being derived from said first signal component;
clipping means for limiting an amplitude level of said first and second signal components to a predetermined level to provide first and second limited signal components;
integrating means for separately integrating said first and second limited signal components and providing first and second integrated signals; and
means for determining a difference between said first and second integrated signals and supplying a signal corresponding to said difference to said comparator means as said reference signal.

4,577,156
PUSH-PULL BETATRON PAIR

Donald W. Kerst, Madison, Wis., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 22, 1984, Ser. No. 582,420
Int. Cl.[4] H05H *7/08*
U.S. Cl. 328—237 **6 Claims**



1. A betatron accelerator, comprising
an annular betatron tube having a vacuum chamber therein in which charged particles are to be accelerated,
a magnetic circuit including an axial magnetic core along the axis of said tube,
accelerating flux producing means for producing a changing accelerating flux in said core and linking with said tube for producing acceleration of charged particles in said tube,
alternating current guide field producing means for producing an alternating current guide field through said tube for guiding the charged particles along generally circular orbits in said tube,
an alternating current source for energizing said guide field producing means,
first and second oppositely polarized direct current sources,
switching means including an AC switching device for connecting said alternating current source to said accelerating flux producing means,
a first DC switching device for connecting said first direct current source to said accelerating flux producing means,
a second DC switching device for connecting said second oppositely polarized direct current source to said accelerating flux producing means,
and control means for closing said AC switching device during approximately the first 90° of the guide field cycle,
said control means closing said first DC switching device while opening said AC switching device and said second DC switching device during approximately the second

90° of said cycle to clamp the accelerating flux at its positive maximum value,

said control means closing said AC switching device while opening both of said DC switching devices during approximately the third 90° of said cycle for rapidly changing the accelerating flux between its positive and negative maximum values,

said control means closing said second DC switching device while opening said AC switching device and said first DC switching device during approximately the fourth 90° of said cycle to clamp the accelerating flux at its negative maximum value,

and means for injecting a first electron beam for acceleration in one direction of rotation during said first 90° while injecting a second electron beam for acceleration in the opposite direction of rotation during said third 90° .

4,577,157

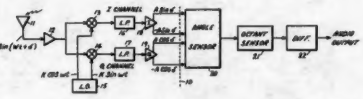
ZERO IF RECEIVER AM/FM/PM DEMODULATOR USING SAMPLING TECHNIQUES

Joseph Reed, Stamford, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,686

Int. Cl.⁴ H03D *3/18, 3/00, 5/00;* **H04B** *1/16*

U.S. Cl. 329—50 **23 Claims**



1. Apparatus for use in demodulating the information content in the I and Q channel of a zero IF receiving apparatus comprising:

angle sensing means responsive to said I and Q channel signals for providing at an output angle signals indicative of phase angles associated with said I and Q signals being within specified ranges of angles,

means responsive to said angle signals to provide an indication of which one of a plurality of octants each of said phase angles is in to specify said angle as one between 0° to 360° for assigning one of a plurality of predetermined angular values to said phase angles as indicative of said octant and means responsive to said assigned angular values to provide at an output a demodulated signal.

4,577,158

DEMODULATOR WITH DROP-OUT COMPENSATION AND RECIPROCAL AMPLIFIER

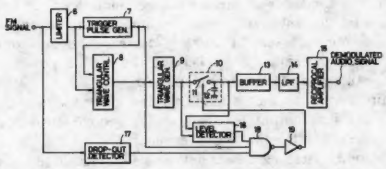
Kazuo Kuroda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 561,868

Claims priority, application Japan, Dec. 16, 1982, 57-220848

Int. Cl.⁴ H03K *9/06;* **H03D** *3/00*

U.S. Cl. 329—104 **6 Claims**



1. An FM signal demodulating circuit comprising:

drop-out detecting means for generating a drop-out signal when an input FM signal drops out;

period detecting means for detecting the period of said FM signal in the absence of said drop-out signal to produce a periodic signal;

voltage generating means for generating a voltage, a level of the voltage corresponding to the period of said FM signal;

sample-and-hold means for sampling an output of said voltage generating means in response to said periodic signal and for holding the same;

reciprocal arithmetic means for producing a signal representing the reciprocal of the level of signal held by said sample-and-hold means;

and means responsive to said drop-out detecting means for causing said sample-and-hold means to stop sampling when said drop-out detection means detects a drop-out.

4,577,159

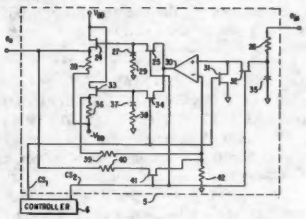
LOW DRIFT BROADBAND AMPLIFIER

Noel M. Pace, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 27, 1984, Ser. No. 635,321

Int. Cl.⁴ H03F *1/02*

U.S. Cl. 330—9 **3 Claims**



1. A broadband amplifier, having a low D.C. drift characteristic, the boardband amplifier comprising:

first differential amplifier means having an inverting input, a non-invverting input and an output;

first switching means, coupled to the first differential amplifier means, for alternately connecting the non-inverting input of the first differential amplifier means to an input signal during an amplifying mode of operation of the boardband amplifier and to a source of ground potential during a sample and hold mode of operation of the broadband amplifier;

feedback means, coupled to the first differential amplifier means, for controlling the gain thereof;

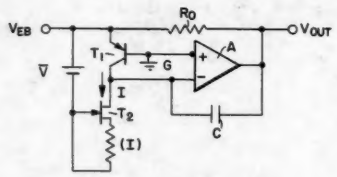
D.C. drift compensation means having first and second sample and hold means, coupled to the first differential amplifier means, said first sample and hold means being operative for storing a D.C. input offset voltage of the first differential amplifier means during the sample and hold mode of operation of the broadband amplifier, said second sample and hold means being operative for storing a D.C. input offset voltage of said D.C. drift compensation means during the amplifying mode of operation of the boardband amplifier; and

controller means, coupled to the first switching means and to the D.C. drift compensation means, for supplying a control signal for alternately switching the operation of the broadband amplifier between the amplifying mode of operation and the sample and hold mode of operation.

4,577,160
METHOD OF AND APPARATUS FOR LOW NOISE CURRENT AMPLIFICATION

Jerome Y. Lettvin, Cambridge, and George M. Plotkin, Lynn, both of Mass., assignors to Robert H. Rines, Concord, N.H., a part interest

Continuation-in-part of Ser. No. 455,305, Jan. 3, 1983, abandoned. This application Dec. 22, 1983, Ser. No. 564,360
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 330—149 **27 Claims**

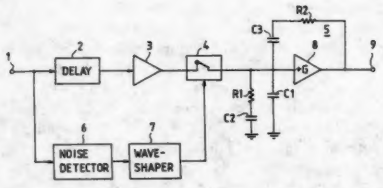


1. In an electronic amplifier apparatus comprising a differencing amplifier circuit connected to receive signal from and to feedback to an electronic switching device, a method of enabling low-noise current amplification of a signal from low impedance source means, that comprises, passing equal but opposite currents with the correlated noise from a common source in opposite directions through the switching device to produce minimal resultant uncorrelated noise therein, and superimposing the signal from said low impedance source means as an increment to the current through said device of magnitude much smaller than said opposite currents.

4,577,161
NOISE REDUCTION BY LINEAR INTERPOLATION USING A DUAL FUNCTION AMPLIFIER CIRCUIT

Kazutoshi Hirohashi, Yokohama; Yukinobu Ishigaki, Tokyo, and Yasuomi Namiki, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Aug. 8, 1984, Ser. No. 638,779
Claims priority, application Japan, Aug. 8, 1983, 58-144651
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 330—149 **19 Claims**



1. A noise reduction circuit having an input terminal to which an information signal is applied and an output terminal, comprising:

means connected to said input terminal for detecting a noise impulse introduced in said information signal and generating therefrom a sampling pulse that is time-coincident with the portion of the signal affected by said noise impulse;

a switch connected in a circuit path between said input and output terminals for passing said information signal therethrough in the absence of said sampling pulse and blocking said signal in response to said sampling pulse;

a first amplifier connected in said circuit path between said input terminal and said switch, said first amplifier having an input and output and an output impedance;

a second, noninverting amplifier connected in said circuit path between said switch and said output terminal, the second amplifier having an input impedance greater than the output impedance of said first amplifier, said second amplifier having an input and output;

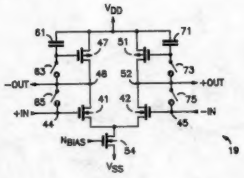
a capacitor coupled from a node between said switch and the input of said second amplifier to ground; and

feedback circuit means coupled from the output of said second amplifier to the input thereof, the feedback circuit means including time constant means forming a plurality of time constant values with said capacitor for providing primary and secondary differentiation on an output signal from said second amplifier and applying the differentiated signal to the input of said second amplifier.

4,577,162
CLOCKED GAIN STAGE HAVING DIFFERENTIAL INPUTS AND OUTPUTS

Joe W. Peterson, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1985, Ser. No. 728,628
Int. Cl.⁴ H03F *3/16, 3/04*
U.S. Cl. 330—253 **8 Claims**



8. A fully differential gain stage for receiving first and second input voltages and providing first and second output voltages proportional to a differential of the first and second input voltages, comprising:

a first transistor of a first conductivity type having a first current electrode connected to a first output terminal, a second current electrode, and a control electrode for receiving the first input voltage;

a second transistor of the first conductivity type having a first current electrode connected to a second output terminal, a second current electrode, and a control electrode for receiving the second input voltage;

a third transistor of the first and conductivity type having a first current electrode connected to the second current electrode of both the first and second transistors, a second current electrode connected to a first terminal for receiving a first power supply voltage, and a control electrode for receiving a bias voltage;

a fourth transistor of a second conductivity type having a first current electrode connected to the first output terminal, a second current electrode connected to a second terminal for receiving a second power supply voltage, and a control electrode;

a fifth transistor of the second conductivity type having a first current electrode connected to the second output terminal, a second current electrode connected to the second terminal for receiving the second power supply voltage, and a control electrode;

first switching means having a first electrode connected to the first output terminal, and a second electrode connected to the first input terminal;

second switching means having a first electrode connected to the first output terminal, and a second electrode connected to the control electrode of the fourth transistor;

a first capacitor having a first electrode connected to both the control electrode of the fourth transistor and the second electrode of the second switching means, and a

second electrode connected to the second terminal for receiving the second power supply voltage;

third switching means having a first electrode connected to the second output terminal, and a second electrode connected to the second input terminal;

fourth switching means having a first electrode connected to the second output terminal, and a second electrode connected to the control electrode of the fifth transistor; and

a second capacitor having a first electrode connected to both the control electrode of the fifth transistor and the second electrode of the fourth switching means, and a second electrode connected to the second terminal for receiving the second power supply voltage.

4,577,163

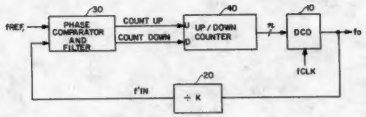
DIGITAL PHASE LOCKED LOOP

Norman L. Culp, Colorado Springs, Colo., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Jul. 9, 1984, Ser. No. 629,035

Int. Cl.[4] H03L *7/18*

U.S. Cl. 331—1 A **2 Claims**



1. A digital phase locked loop comprising:

(a) a digital controlled oscillator means for generating an output signal having a frequency which is a function of a value associated with a digital input word, wherein said digital controlled oscillator means comprises:

(i) storage means, for holding a binary sum word;

(ii) adder means, operatively connected to said storage means and to said counter means, for generating a new binary sum word, the new binary sum word being the sum of the binary sum word received from said storage means and the binary number received from said counter means, the new binary sum word being stored in said storage means to generate another sum word during the subsequent add cycle; and

(iii) output means, operatively connected to said adder means, for strobing a carry signal resulting from the generation of the new binary sum word by said adder means, to generate said output signal;

(b) counter means, operatively connected to said digital controlled oscillator means, having an up input terminal adapted to receive an up input signal, and having a down input terminal adapted to receive a down input signal, for modifying a binary number contained in said counter means in response to said up input signal and in response to said down input signal, said binary number being operatively coupled to said digital controlled oscillator means; and

(c) phase comparator means, operatively connected to said counter means, for comparing the frequency of a reference signal to the frequency of said output signal, to generate the up input signal when the output signal lags the reference signal, and to generate the down input signal when the output signal leads the reference signal.

4,577,164

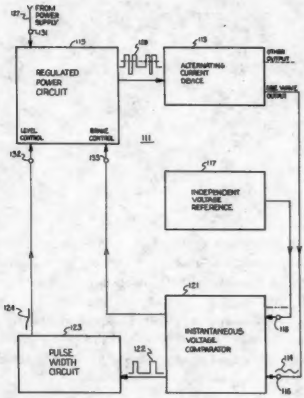
DRIVE REGULATOR UTILIZING VARIABLE PULSE WIDTH SIGNAL

Boris F. Grib, Dix Hills, N.Y., assignor to Philamon Incorporated, Farmingdale, N.Y.

Continuation-in-part of Ser. No. 16,160, Mar. 1, 1979, Pat. No. 4,499,436. This application Oct. 1, 1984, Ser. No. 656,711

Int. Cl.[4] H03B *5/30;* **H03L** *5/00*

U.S. Cl. 331—109 **20 Claims**



1. A drive current control circuit for an alternating current electrical device having an output comprising

means for providing a drive current to said device,

means for obtaining a sine wave electrical signal having an amplitude proportional to the output of said device,

means for producing a constant reference signal for comparison with said sine wave electrical signal,

means for producing a pulse signal having a pulse width which varies as the excess of said sine wave electrical signal over said reference signal,

means for producing a control signal with a magnitude varying approximately as a moving average of the width of pulses of said pulse signal, and

means for reducing said drive current to said device in response to said control signal.

4,577,165

HIGH-FREQUENCY OSCILLATOR WITH POWER AMPLIFIER AND AUTOMATIC POWER CONTROL

Akira Uehara; Takashi Uehara, both of Kanagawa; Miyuki Saito, Saitama, and Toshiyuki Ishida, Tokyo, all of Japan, assignors to Tokyo Denshi Kagaku Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1984, Ser. No. 580,853

Claims priority, application Japan, Feb. 22, 1983, 58-28195; Feb. 22, 1983, 58-28196

Int. Cl.[4] H03B *5/36;* **H03L** *5/02*

U.S. Cl. 331—109 **7 Claims**

3. A high-frequency oscillator, comprising:

an oscillation circuit (1) having a high-frequency oscillatory element (X) and amplifying element (Q_2) for amplifying the output of said oscillatory element;

a power amplification circuit (3) for amplifying the power of a high-frequency output of said oscillation circuit;

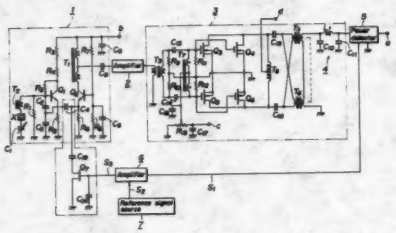
control means (Q_7, 6) for varying a bias voltage of said amplifying element to thereby control the output power of said power amplification circuit;

said control means having a field effect transistor (Q_7) connected at the drain thereof to said amplifying element and

a control circuit (6) for applying a direct-current control signal (S_3) to the gate of said field effect transistor;

said power amplification circuit comprises a metal-oxide semi-conductor type field effect transistor (Q_3, Q_4, Q_5, Q_6);

said control means further has a power detector (5) for detecting said output power of said power amplification



circuit to give a converted direct-current signal (S_1) according thereto, and a reference signal source (7) for giving a predetermined reference signal (S_2) while it is continuously energized; and

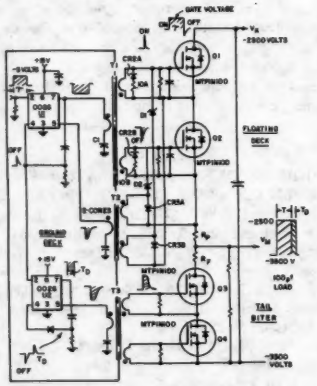
said control circuit comprises an amplifier (6) for amplifying the difference between said converted signal and said reference signal to produce said control signal.

4,577,166

MINIATURE HIGH PERFORMANCE PULSED MODULATOR APPARATUS

Walter E. Milberger, Severna Park, and Franklin B. Jones, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 22, 1984, Ser. No. 643,201
Int. Cl.[4] H03K *7/08*
U.S. Cl. 332—9 T **7 Claims**



1. A pulsed modulator apparatus comprising in combination:

a first clock driver means receiving an input trigger pulse of a predetermined pulse width, said first clock driver means providing a first output pulse in response to said input trigger pulse, a second input pulse derived from said first output pulse and applied to said clock driver means to provide a second output pulse,

a first coupling means connected to said first clock driver means to receive said first output pulse therefrom,

a second coupling means connected to said first clock driver means to receive said second output pulse therefrom, and,

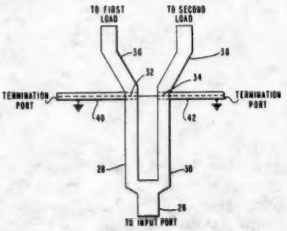
a first switching means connected to both said first and second coupling means to receive the outputs therefrom, said first coupling means providing an on signal to said first switching means in response to said first output pulse, said first switching means connected between a first and second predetermined voltage, said first switching means switching from said first predetermined voltage to said second predetermined voltage, said first switching means providing an output pulse signal in response to said on signal, said second coupling means providing an off signal to said first switching means in response to said second output pulse, said first switching means switching from said second predetermined voltage to said first predetermined voltage in response to said signal, said output pulse signal having an output pulse width equal to or greater than the time difference between said first and second output pulse, said output pulse signal is applied to a load means.

4,577,167

MICROSTRIP LINE BRANCHING COUPLER HAVING COAXIAL COUPLED REMOTE TERMINATION

Gary E. Evans, Trappe, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1982, Ser. No. 447,824
Int. Cl.[4] H01P *5/12*
U.S. Cl. 333—128 **9 Claims**



1. A microwave coupler comprising:

(a) a first port coupled to first ends of first and second microstrip transmission lines (28 and 30), said first and second transmission lines (28 and 30) having a predetermined electrical length;

(b) second and third ports (32 and 34) respectively coupled to third and fourth microstrip transmission lines (36 and 38) and to second ends of said first and second microstrip transmission lines (28 and 30); and

(c) coaxial transmission line means (40 and 42) coupled to said second ends of said first and second microstrip transmission lines (28 and 30), said coaxial transmission line means extending to at least one remote location and terminating thereat.

4,577,168

NOTCH FILTER

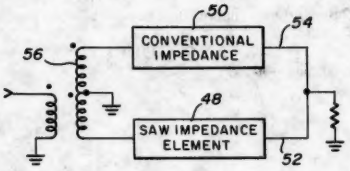
Clinton S. Hartmann, Richardson, Tex., assignor to R. F. Monolithics, Inc., Dallas, Tex.

Filed Dec. 3, 1984, Ser. No. 677,295
Int. Cl.[4] H03H *7/07, 7/09, 9/64*
U.S. Cl. 333—170 **35 Claims**

1. An improved notch filter for rejecting a predetermined band of signal frequencies comprising:

a. a first circuit having a signal input terminal and a signal output terminal for providing an output signal at said output terminal, said first circuit having an inductor in parallel with an impedance element having an input admit-

tance substantially constant in both magnitude and phase over a predetermined band width at the center of the notch frequency, said first circuit having primarily reactive characteristics at signal frequencies higher or lower than the notch frequency band width and primarily resistive characteristics at the center of said notch frequency, and



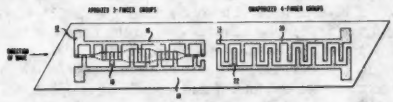
b. a second circuit having a signal input terminal and a signal output terminal in electrical parallel with said first circuit and being resistive at all frequencies and having a second output signal at its output terminal 180° out-of-phase with said first circuit output signal whereby at the center of said notch frequency said first and second circuit output signals are substantially equal and cancelling thereby providing no output and rejecting a predetermined band width of frequencies.

4,577,169

SMALL RIPPLE SURFACE ACOUSTIC WAVE FILTER WITH LOW INSERTION LOSS

Thrygve R. Meeker, Allentown, and Wei-Shin Tsay, Fogelsville, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 1, 1984, Ser. No. 636,679
Int. Cl.⁴ H03H *9/64, 9/145*
U.S. Cl. 333—194 **9 Claims**



1. A surface acoustic wave filter comprising substrate means having at least a major surface layer of a piezoelectric material;

an input transducer for transforming an electrical input signal into an acoustical signal, said input transducer including a first electrode responsive to an input signal of positive polarity and a second electrode responsive to an input signal of negative polarity, each electrode being recessed into said substrate means to be essentially coplanar with said major surface layer and comprising a plurality of electrode fingers, said positive and negative electrode fingers being interleaved to form an interdigitated electrode finger configuration and disposed to form a plurality of finger groups capable of reducing reflection between adjacent electrode fingers, each group including a set of N equal length finger electrodes of both positive and negative polarity, said input transducer being apodized such that adjacent finger groups comprise electrode fingers of different lengths perpendicular to the direction of travel of a surface acoustic wave, wherein the different lengths are determined in accordance with a predetermined apodization equation (W(t,T)); and

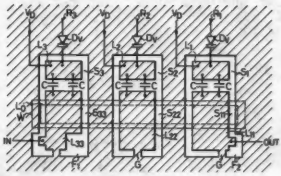
an output transducer including a first electrode of positive polarity and a second electrode of negative polarity, each electrode responsive to the acoustic signal generated by said input transducer for providing as an output an associated electrical signal, each electrode being recessed into said substrate means to be essentially coplanar with said major surface layer and comprising a plurality of electrode fingers, said positive and negative electrode fingers being interleaved to form an interdigitated electrode finger configuration and disposed to form a plurality of finger groups capable of reducing reflection between adjacent electrode fingers, each group including a set of M fingers of both positive and negative polarity, M being different from N.

4,577,170

VARIABLE TUNING FILTER IN HIGH FREQUENCY CIRCUIT

Isao Hayashi, Tokyo, Japan, assignor to Kyocera Corporation, Japan

Filed Jan. 31, 1985, Ser. No. 696,928
Claims priority, application Japan, Feb. 2, 1984, 59-14847[U]
Int. Cl.⁴ H01P *1/203, 7/08*
U.S. Cl. 333—205 **2 Claims**



1. A high frequency variable tuning filter comprising:

a dielectric substrate;

a grounding conductive layer on the surface of one side of the substrate and an electrically conductive film layer on the other side thereof;

a plurality of adjacent resonators each including two areas of the electrically conductive layer formed by a figure eight shaped groove in said electrically conductive layer, wherein a portion of the electrically conductive layer small in width remains in said 8-shaped groove to connect one of said two areas to the portion of the electrically conductive layer outside of said groove, and wherein a portion of said electrically conductive film layer remains between the adjacent resonators; and

a region on said one side of the dielectric substrate which is positioned opposite the resonators, wherein the region is formed by removing a part of said grounding conductive layer.

4,577,171

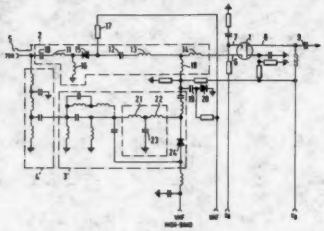
INPUT CIRCUIT COMPRISING AT LEAST TWO INPUT PATHS

Franz Heigl, Ochsenfeld, and Josef Rehm, Rohrbach, both of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,205
Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317219
Int. Cl.⁴ H03J *5/00;* **H04B** *1/18*
U.S. Cl. 334—1 **17 Claims**

1. An input circuit for a combined UHF and VHF tuner comprising in combination: a common antenna terminal; a UHF selection filter and a VHF selection filter each having its input connected to said common antenna terminal; a common output amplifier for said input circuit, said amplifier having its input connected to the output of said UHF selection filter; an impedance included in said UHF selection filter and having one end connected for high frequency to said input of said amplifier; first circuit means, including a controllable switch, for connecting the other end of said impedance to ground for high frequency via said switch when said switch is closed; and

second circuit means for connecting the output of said VHF selection filter to said other end of said impedance so as to cause said output of said VHF selection filter to be connected



to ground for high frequency via said switch when it is closed and so as to cause said output of said VHF selection filter to be connected to said input of said amplifier when said switch is open.

4,577,172

ELECTROMAGNETIC RELAY AND METHOD FOR THE MANUFACTURE THEREOF

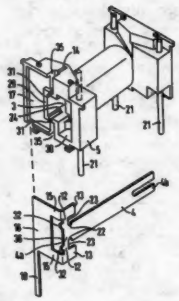
Helmut Schedele, Diessen, and Josef Schweiger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,893

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338198

Int. Cl.⁴ H01H *51/22*

U.S. Cl. 335—80 **19 Claims**



1. An electromagnetic relay, comprising:

a coil body serving as a base body;

an armature or contact tongue element secured at one end and being aligned in an axial cavity of said base body;

the secured end of the tongue element being secured in grooves of a first coil flange of the base body via lateral fastening tabs, and an opposite free end of the element being movable adjacent to a pole plate or cooperating contact element in a region of a second coil flange of the base body;

a thickness of said fastening tabs being significantly less than a width of said grooves in said first coil flange which accepts the fastening tabs; and

said fastening tabs being fixed by means of a hardened glue which fills in a space in said grooves.

4,577,173

ELECTROMAGNETIC RELAY AND METHOD FOR MANUFACTURING SUCH RELAY

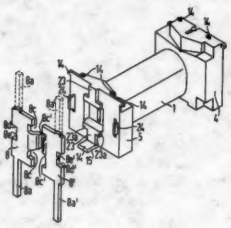
Helmut Schedele, Diessen; Josef Schweiger, and Heinz Stadler, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,894

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338208

Int. Cl.⁴ H01H *51/22*

U.S. Cl. 335—80 **15 Claims**



1. An electromagnetic relay comprising a coil body, a tongue-shaped armature mounted in an axially through opening of said coil body, said armature having a fastening end secured in the region of a first coil flange to said coil body and having its free end switchable between two pole plates in the region of a second coil flange of said coil body, a flux transfer plate mounted against said first coil flange at the fastening end of said armature, whereby said pole plates have at least one section lying flat against the end face of said second coil flange and rest against two spacing members of said coil flange which are formed as extensions of the narrow sides of said armature, a respective sealing film at the end faces of both said first and second coil flanges, a rim bead (**17, 47**) formed on said first coil flange (**4, 34**) which surrounds the coil body opening (**3, 33**), said rim bead penetrated by two retaining webs (**21, 51**) of the armature (**6, 36**) which correspond to the height of the bead (**17, 47**) which penetrate at only two opposite sides thereof, the spacing members (**23, 53**) of said second coil flange (**5, 35**) project over the end face of said second coil flange (**5, 35**) with a height corresponding to the thickness of said pole plates (**8, 8', 38, 38'**), and said pole plates (**8, 8', 38, 38'**) positioned between said spacing members (**23, 53**) and at retaining tabs (**24, 54**) provided at the edge of said coil flange (**5, 35**).

4,577,174

ELECTROMAGNET FOR ELECTRIC SWITCHING DEVICE

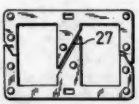
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Marienheide, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 709,788

Claims priority, application European Pat. Off., Mar. 31, 1984, 84103594.2; Oct. 25, 1984, 84112847.3

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—261 **6 Claims**



1. An electromagnet for an electromagnetic switching device, particularly safety switch, utilized for direct current and

comprising a magnetic core and a movable armature, said core and said armature being each formed of a plurality of superposed laminations assembled into a pack and connected to each other by rivets, said core and said armature being each assembled of evenly shaped laminations, said armature and said core each having two outer legs and one central leg, one of the outer legs having a free end and being formed with an oblique surface which merges into a flat end face, the other of the other legs having a free end formed with another oblique surface and with a flat stop surface, said another oblique surface and the stop surface fitting said first mentioned oblique surface and said end face, respectively, when the armature is laid over the magnetic core, said central leg having a further oblique surface such that an air gap results between the further oblique surface of the central leg of the core and the further oblique surface of the cnetral leg of the armature when the latter and the core are in assembly.

4,577,175

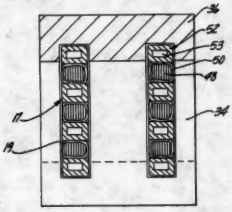
TRANSFORMER WITH FLUID COOLED WINDINGS

Peter H. Burgher, and Raymond F. Marsden, both of Howell, Mich., assignors to Marelco Power Systems, Howell, Mich.

Continuation of Ser. No. 416,376, Sep. 13, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 624,945

Int. Cl.⁴ H01F *27/08*

U.S. Cl. 336—61 **12 Claims**



1. In combination with a transformer having a core, a primary winding and a secondary winding, the improvement comprising one of said windings being formed from at least one tubular member formed in a plurality of first loops, said at least one tubular member defining a fluid passageway in said winding, and the other of said windings comprising a plurality of second loops, each of said second loops being consecutively interpositioned between loops of said one winding, each said loop of said other winding comprising a plurality of coils of a flat conductor having flat sides terminating at narrow ends, so that the conductor is aligned parallel to the axis of the coil and wherein each narrow axial end of coil of flat conductor lies adjacent a loop of said tubular member.

4,577,176

TEMPERATURE REGULATING DEVICE

Helmut Bayer, Vienna, Austria, assignor to Electrovac Gesellschaft m.b.H., Vienna, Austria

Filed Dec. 27, 1983, Ser. No. 565,552

Claims priority, application Austria, Jan. 5, 1983, 31/83

Int. Cl.⁴ H01H *37/48*

U.S. Cl. 337—394 **9 Claims**

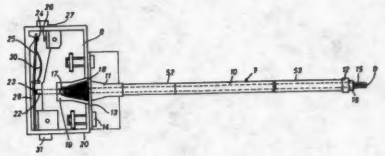
1. A device for regulating temperature of a heat source in a heating appliance wherein a heat source provides plural heating zones, the heat source including heating elements, the appliance having a heating surface; said device comprising:

at least one temperature sensor disposed between said heat source and said heating surface;

an electrical contact system for switchably energizing said heat source for regulation of the temperature thereof, and an electrically insulating housing supporting said contact system at an inner end of said temperature sensor;

said temperature sensor having a bar with a sufficiently high coefficient of thermal expansion for operating said contact system, said temperature sensor further comprising a tube which encloses said bar and connects therewith at an outer end of said sensor, one end of said bar being in communication with said contact system for regulation of the temperature of said heat source; and wherein

the tube is formed of at least two tube lengths arranged serially one behind the other along an axis of the tube at locations corresponding to sites of respective ones of the



heating zones to insure direct action of heat by each heating zone on the corresponding tube length, opposite ends of the tube being electrically insulated from each other, each of said tube lengths being exposed to heat from a plurality of said heating zones; and

at least two of said tube lengths have a thermal expansion different from each other within the temperature range between 20° C. and 700° C., the total expansion of the tube formed of said tube lengths being less than the thermal expansion of the bar within said temperature range.

4,577,177

DISPLAY APPARATUS FOR ELEVATOR CAR

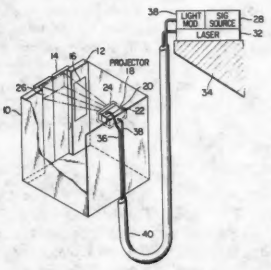
Akira Marubashi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,530

Claims priority, application Japan, Jun. 1, 1983, 58-97220

Int. Cl.⁴ B66B *3/00*

U.S. Cl. 340—19 R **10 Claims**



1. An apparatus for displaying image information within an elevator car, comprising a projector disposed in an elevator car and formed of a light deflector, a diminishing lens disposed on an entrance side of said light deflector, and an objective lens disposed on an exit side thereof; a laser disposed on a stationary part for an elevator system including the elevator car to form a light source for generating a light beam, a signal source disposed on said stationary part to generate a modulating signal as determined by a piece of image information to be displayed, a light modulator disposed on said stationary part to modulate said light beam from said light source with said modulating signal from said signal source; an optical fiber for leading said modulated light beam from said light modulator to said diminishing lens included in said projector, and a set of electrical conductors for connecting said signal source to said light deflector; the arrangement being such that the light beam

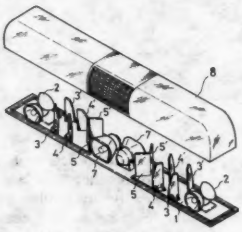
deflected by said light deflector is focussed on an inner surface of said elevator car by means of said objective lens.

4,577,178

REFLECTION TYPE FLOW-FLASHING LIGHT

Shozo Hitora, Nara, Japan, assignor to Sasaki Electric Manufacturing Co., Ltd., Osaka, Japan

Filed Apr. 20, 1983, Ser. No. 486,649
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—81 R **7 Claims**



1. A reflection type flow-flashing light comprising: an elongated base having a forward and rearward direction;

at least one rotating light operatively positioned at one end of said elongated base;

a plurality of reflecting plates being spaced relative to each other and being mounted on said elongated base adjacent to said rotating light, each of said reflecting plates being disposed at a predetermined position for enabling light emitted from said rotating light to pass therebetween to impinge upon each of said reflecting plates while reflecting said light in a direction both forward and rearward;

said elongated base includes a first end and a second end, said at least one rotating light being positioned adjacent to said first end and further including a second rotating light operatively positioned adjacent to said second end and a plurality of reflecting plates being spaced relative to each other and being mounted on said elongated base adjacent to said second rotating light, each of said reflecting plates being disposed at a predetermined position for enabling light emitted from said rotating light to pass therebetween to impinge upon each of said reflecting plates while reflecting said light in a direction both forward and rearward.

4,577,179

PROGRAMMER/TIMER FOR APPLIANCES

Worthy L. Chambers, Lombard; William H. Jones, Villa Park, and Arthur H. Hayden, Crystal Lake, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 15, 1982, Ser. No. 367,867
Int. Cl.[4] G08B *1/00*; H01H *7/08*
U.S. Cl. 340—309.15 **5 Claims**

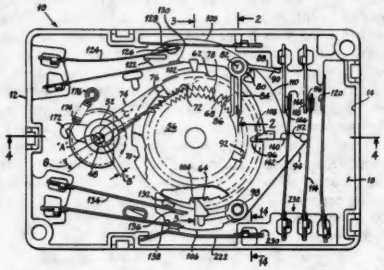
1. A device for electrical switching in timed sequence comprising:

(a) a primary and secondary cam means rotatably mounted on a housing about respectively first and second spaced centers of rotation;

(b) electrical switch means including primary cam follower means responsive to movement of said primary cam means for effecting electrical switching of contacts in accordance with a first program sequence;

(c) secondary cam follower means responsive to said secondary cam means for altering said electrical switching in accordance with a second program sequence;

(d) ratchet and pawl means operative to cause rotation of said primary cam means and including a ratchet wheel rotatable about said first center and a drive pawl orbital about said second center; and,



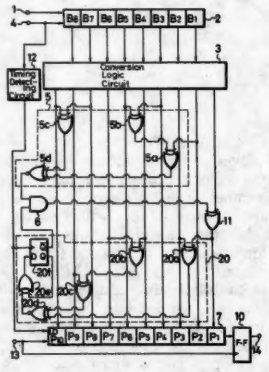
(e) drive means rotatable about said second center to cause said pawl to index said ratchet.

4,577,180

DIGITAL DATA CONVERTING METHOD AND APPARATUS THEREOF

Shinichi Fukuda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,374
Claims priority, application Japan, Nov. 24, 1983, 58-221235
Int. Cl.[4] H03K *13/00*
U.S. Cl. 340—347 DD **6 Claims**



1. A method for converting a digital signal into an NRZI (non-return to zero, inverted)-coded signal, the method comprising the steps of:

dividing a base digital signal into a series of base words with each m bits of data;

converting said base digital signal into a converted digital signal by matching a converted word with each said base word, each said converted word having n bits of data, wherein n is greater than m and said converted digital signal has a predetermined maximum number of consecutive digital zeroes;

detecting if the value of every odd-numbered bits of said converted word is digital zero;

producing a detecting signal according to the result of said detecting;

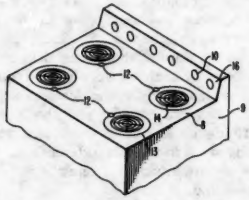
controlling said converted word in response to said detecting signal; and

modulating said converted digital signal as an NRZI-coded digital signal.

4,577,181
ALARM SYSTEM FOR ELECTRIC RANGE

Bernard Lipscher, 8 Hamilton Ave., and Kevin G. Coleman, 3 Franklin Ave., both of Wheeling, W. Va. 26003

Filed Mar. 4, 1985, Ser. No. 707,950
Int. Cl.[4] G08B *19/00;* H05B *1/02*
U.S. Cl. 340—522 3 Claims



1. In an alarm system for an electric range for detecting when a burner is energized without a utensil in place on said burner, said electric range having:

a generally planar stovetop with an opening for a burner,

a dish which rests in said opening, said dish having a rim that rests on the stovetop and supports the dish, and

a heating element which rests in said dish and which is energized by electric current controlled by a burner control switch; and said alarm system having a sensing means for detecting the presence or absence of a utensil on the heating element and an alarm means responsive to said sensing means and said burner control switch; the improvement, wherein said sensing means comprises:

an electrical switch mounted below the stovetop having a first switch position and a second switch position;

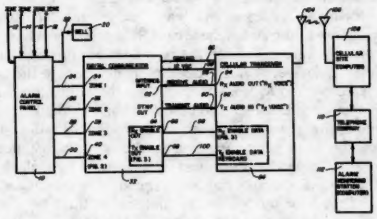
a pin slidably passing through an opening in said stovetop beneath the rim of said dish in contact with the underside of said rim and biased against said rim with a pressure sufficient to lift the rim from the stovetop when no utensil is present on the heating element, but insufficient to lift the rim when a utensil is in place on the heating element,

means connecting said pin with said switch to operate the switch between the first and second positions corresponding to the position of the pin when a utensil is present or absent from the heating element.

4,577,182
ALARM SYSTEM

James W. Millsap, Hammond, Ind., and Peter Miller, 5659 N. Drake, Chicago, Ill. 60659, assignors to Peter Miller, Chicago, Ill.

Filed Apr. 10, 1984, Ser. No. 598,851
Int. Cl.[4] G08B *1/08;* H04M *11/04*
U.S. Cl. 340—539 9 Claims



7. A system for providing a relatively tamperproof alarm of a protected premises at a fixed location, which comprises the steps of:

providing a digital communicator having an audio input and an interrogation input;

coupling an alarm signal line to said digital communicator;

providing a cellular transceiver having a programmable means, an audio input and an audio output;

coupling said digital communicator audio output to said cellular transceiver audio input;

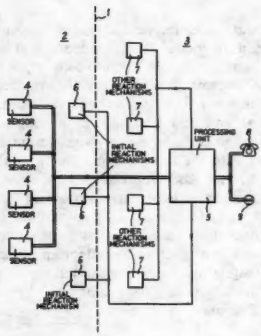
coupling said cellular transceiver audio output to said digital communicator interrogation input;

when an alarm condition occurs, providing a signal from said digital communicator to said cellular transceiver to automatically transmit an over-the-air signal to a cellular site, where it can be forwarded to an alarm monitoring station with the alarm monitoring station being placed in two-way communication with the cellular transceiver via the cellular site.

4,577,183
APPARATUS FOR THE PROTECTION OF PLACES SUCH AS RESIDENCES

Guy Fontaine, Marnes-la-Coquette, and Serge Achard, Marly-le-Roi, both of France, assignors to Promocab, S.A., Versailles, France

Filed Mar. 12, 1982, Ser. No. 357,647
Claims priority, application France, Mar. 13, 1981, 81 05061
Int. Cl.[4] G01B *13/02*
U.S. Cl. 340—541 5 Claims



1. A device for the protection of premises such as residences, comprising two chains of human presence detection sensors, a processing unit and reaction mechanisms, one of said chains of human presence detection sensors being located outside said premises, and one of said chains of human presence detection sensors being located inside said premises, said reaction mechanisms including means for simulating a presence inside the premises, controlled by the processing unit to simulate a human presence, and said processing unit including means for modifying the operation of the reaction mechanisms each time a human presence detection sensor is activated.

4,577,184
SECURITY SYSTEM WITH RANDOMLY MODULATED PROBE SIGNAL

Henri Hodara, Altadena, and Willard H. Wells, Arcadia, both of Calif., assignors to Tetra-Tech, Inc., Pasadena, Calif.

Filed May 23, 1983, Ser. No. 496,951
Int. Cl.[4] G08B *13/00, 13/18*
U.S. Cl. 340—566 8 Claims

1. An alarm system for a facility whose security is to be monitored, said system comprising:

a probe-signal source for generating a probe signal;

a modulating-signal source for generating a substantially

random modulating signal for use in modulating the probe signal;

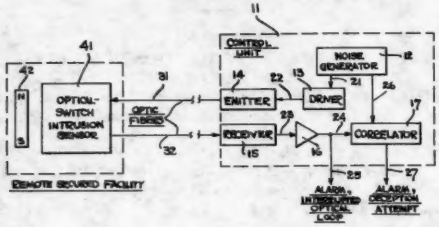
a modulator, responsive to the random modulating signal, for applying the modulating signal to the probe signal to produce a modulated probe signal that fluctuates substantially in accordance with the random modulating signal;

an intrusion sensor that establishes at least a secure condition and an alarm condition of such a facility, and that receives the modulated probe signal and impresses information as to the source or alarm condition upon the modulated probe signal, to form a composite reply signal;

a signal receiver for receiving the composite reply signal;

a first signal path for carrying the modulated probe signal to the intrusion sensor;

a second signal path for carrying the composite reply signal from the intrusion sensor to the signal receiver; and



a correlation-testing device that is responsive to the mddulation of the modulating signal, and that is also responsive to the modulation of the composite reply signal at the signal receiver, and that compares the modulation of the composite reply signal with the modulation of the modulating signal, and that generates an attempted-deception signal when the composite-reply-signal modulation is not correlated with the modulating-signal modulation in a particular manner; and wherein:

the signals in at least part of the first signal path and in at least part of the second signal path are optical signals; and

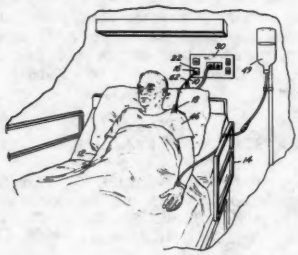
the intrusion sensor comprises an optical mirror that is moved into position to reflect an optical signal from the first signal path into the second signal path if and only if the facility is in a particular one of the secure and alarm conditions.

4,577,185

CONSTRUCTION FOR ALERTING HEALTH-CARE PROFESSIONALS

Frieda Andersen, Munster, Ind., assignor to Saint Margaret Hospital, Hammond, Ind.

Filed Jul. 29, 1983, Ser. No. 518,531
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 **2 Claims**



1. An improved construction for operating a health-care professional alert system upon undesirable movement by a patient, the health-care professional alert system being of the kind having a signaling device that can be activated by a patient and capable of producing a signal detectable by health-care professionals, the signaling device having a patient-operable switch unit connected by a message transmitting cable to a wall-mounted receptacle and constructed such that removal of the patient-operable switch unit activates the signal, the construction comprising, in combination:

an insert mateable with the wall-mounted receptacle, the insert having an insertion end and an exposed end, the insert further comprising a plurality of stacked concentric cylinders, each cylinder being of progressively lesser diameter toward the insertion end, the insert being attached to the cord at the largest diameter cylinder, with the insertion of each cylinder to each adjoining cylinder defining an annular shelf mateable with portions of the interior of the receptacle, and the insert further being compatible with a plurality of receptacles that were each originally sized to receive different diameter inserts;

a segment of cord attached at one end of the exposed end of the insert; and

means for attaching the remaining end of the cord segment to a patient comprising a spring operated clip attached to the cord segment opposite the insert;

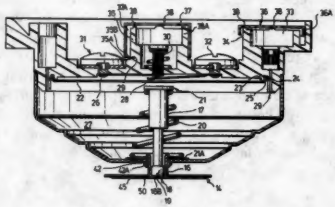
whereby undesirable movement of the patient's body pulls on the cord and results in the detachment of the insert from the receptacle, so that the signaling device activates the signal and alerts a health-care professional that undesirable movement is occuring.

4,577,186

FIRE DETECTOR

Jack Duggan, Markham, Canada, assignor to Fire Detection Devices Ltd., Markham, Canada

Filed Feb. 9, 1984, Ser. No. 578,642
Int. Cl.[4] G08B *17/00*
U.S. Cl. 340—589 **26 Claims**



1. An improved fire detector vented to atmosphere, capable of closing or opening an alarm circuit when the rate of rise of the temperature of the ambient atmosphere exceeds a predetermined prescribed rate of rise of temperature comprising a base supporting a diaphragm enclosing a space between the base and diaphragm, a shell secured to the base enclosing s space between the diaphragm and shell, electrical circuit contacts mounted on the base in the space between the diaphragm and shell for being closed or opened when the rate of rise of the temperature of the atmosphere exceeds a predetermined rate of rise of temperature, at least one vent aperture through the base from the space between the diaphragm and base to the back of the detector, and at least one vent aperture through the base from the space between the base and shell to the back of the detector, the at least one vent aperture through the base between the diaphragm and base to the back of the detector, being surrounded by an endless wall covered by a closure cap having a top and depending skirt, the closure cap spaced from the endless wall by relatively small projections between the top of the closure cap and the top of the endless wall and by relatively thin posts or lugs between the endless wall and depending skirt for spacing the endless wall from the depending skirt, the depending skirt being such as to extend to a position above the bottom of the endless wall remote the top of

the endless wall whereby the atmosphere between the diaphragm and base is permitted to expand into the space between the endless wall and skirt which in turn forces air therefrom into the space at the back of the detector under normal expansion of the ambient atmosphere and draws air into the vent aperture substantially only from the space between the endless wall and skirt under normal contraction of the ambient atmosphere between the diaphragm and base thereby precluding dust and other contaminants in the space at the back of the detector from entering the vent aperture.

7. An improved fire detector comprising a base, a shell secured to the base, a fin secured to the shell by a ferrule passing through the shell at one end and secured to a detent member carried in the shell by a fusible link and at the other end by the ferrule passing through a centrally disposed aperture through the fin, the improvement comprising the fin being connected to the ferrule by causing substantially equally spaced peripheral portions of the ferrule at the end of the ferrule passing through the centrally disposed aperture, to be indented to cause metal from such portions to be forced to flow substantially radially over portions of the fin, surrounding the aperture in the fin, whereby the outer surface of the ferrule engages fin metal surrounding the aperture and metal forced to flow radially from the peripheral indented portions overlies and engages the fin to provide a joint between the two which permits efficient heat transfer between the two.

4,577,187

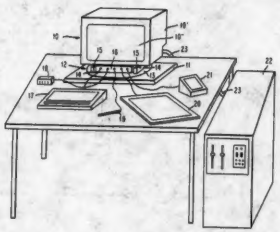
DISPLAY WORKSTATION

Millard G. Barr, Shokan; William H. Barrett, Woodstock; Joseph W. Braidt, New Paltz; John F. Driscoll; Joseph A. Gregory, both of Kingston; Samuel A. Lucente, Glenford, and Louis J. Remsburger, Pine Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1983, Ser. No. 543,741

Int. Cl.⁴ G09F *1/00*; A47B *91/00*; F16M *1/00*

U.S. Cl. 340—700 **12 Claims**



1. A display workstation comprising a display monitor, having a viewing screen, a cable connector means releasably coupled to the monitor in a position below the viewing screen, a plurality of input devices with individual cables which extend to and are releasably coupled to the cable connector means, a separate display control unit, and at least one further cable coupled to the cable connector means and extending therefrom to the control unit, the cable connector means providing electrical connections between the input device cables and the cable to the control unit.

4,577,188

LEVEL DISPLAY DEVICE FOR AUDIO SIGNAL

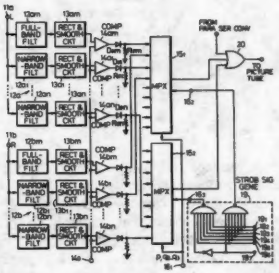
Mamoru Inami, Yokohama; Yoshiaki Tanaka, Fujisawa, and Zenju Ohtsuki, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 30, 1982, Ser. No. 412,968

Claims priority, application Japan, Sep. 3, 1981, 56-138861; Sep. 3, 1981, 56-138862; Sep. 3, 1981, 56-138863; Sep. 3, 1981, 56-138864

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—721 **10 Claims**



1. A level display device for audio signal comprising:

a plurality of bandpass filters having filtering bands of respectively different center frequencies, for band-dividing and filtering an input signal supplied thereto through an input terminal;

pulse width converting means provided in correspondence with respective bandpass filters for converting the input signal into a pulse signal which is in synchronism with a vertical synchronizing signal of a video signal and has a pulse width representative of the level of said input signal, said pulse width converting means comprising a plurality of comparators each of which is supplied with one of the band-divided signals to one input terminal thereof and a comparison voltage to the other input terminal thereof, said comparison voltage being in synchronism with the vertical synchronizing signal and successively varying in the voltage level with time only during a predetermined interval within a vertical scanning period;

level indication signal producing means connected with outputs of said pulse width converting means in parallel, for serially producing said converted pulse signal in synchronism with a horizontal synchronizing signal by successively time-dividing said converted pulse signal during a horizontal scanning period;

character indication signal producing means stored with information signals for displaying characters and the like, for serially obtaining a character indication signal in synchronism with a synchronizing signal of said video signal;

video signal composing means driven by said video signal, for obtaining a video signal by composing an output of said level indication signal producing means and an output of said character indication signal producing means; and

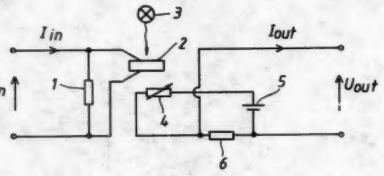
display means for composing and displaying bars corresponding to the audio signal level in a vertical direction, characters, and the like, on a screen of a picture tube, by the outputs of said level indication signal producing means and said character indication signal producing means.

4,577,189

CIRCUITS WITH ELECTRO-OPTICAL FEEDBACK FOR DISPLAY AND A DIGITIZER APPLICATION

Morgan Adolfsson; Iorgny Brogardh, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Mar. 30, 1982, Ser. No. 363,598
Claims priority, application Sweden, Apr. 2, 1981, 8102109
Int. Cl.[4] G09G 3/00
U.S. Cl. 340—794 **26 Claims**



1. A shift register operating with information in electrical and optical form, comprising:

a plurality of series-connected electro-optical memory (EOM) circuits, each being capable of transforming electrical signals into optical signals and optical signals into electrical signals, each said EOM circuit including an optical modulator for modulating the light from a light source and a photo-detector circuit including light sensitive means, said optical modulator and said photo-detector circuit being interconnected with one another to provide an electro-optical feedback loop including light transmission means for transmitting light signals from said optical modulator and means for converting said light signals into electrical signals, and including said photo-detector circuit, to provide an electrical input to said optical modulator and a modulated optical output in response thereto;

an additional photo-detector for transmission of information between each of said series-connected EOM circuits;

means responsive to said additional photo-detector circuit to control an EOM circuit in at least one succeeding EOM circuit; and

a substrate containing said plurality of series-connected EOM circuits and each said additional photo-detectors in the form of an integrated circuit, said optical modulator including a liquid crystal substance, and first and second electrically-conducting spaced layers between which is located said liquid crystal substance with said first electrically-conductive layer being spaced a greater distance from said substrate than said second electrically-conducting layer, and a respective light-polarizing element respectively adjacent said first and second electrically-conducting layers.

4,577,190

PROGRAMMED LOGIC ARRAY WITH AUXILIARY PULL-UP MEANS TO INCREASE PRECHARGING SPEED

Hung-Fai S. Law, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 11, 1983, Ser. No. 483,645
Int. Cl.[4] H03K 19/173; G06F 7/38
U.S. Cl. 340—825.83 **10 Claims**

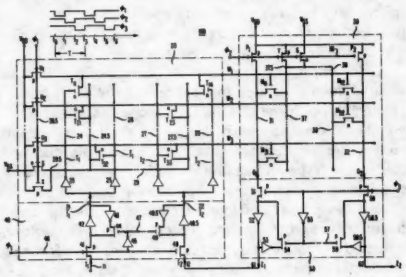
1. A logic array including a PLA comprising a plane having:

(a) a first output line to which a high current-carrying terminal of each of a first plurality of driver transistors is connected;

(b) a clocked ground node to which another high current-carrying terminal of each of the first plurality of driver transistors (M_{11}, M_{31}) is connected;

(c) clocked precharging means connected to the first output line (31) for charging the line essentially to a first predetermined voltage level during only a predetermined portion of each cycle of a clock sequence;

(d) clocked ground node charging means connected to the ground node (37.5) for charging the node essentially to the first predetermined voltage level (V_{DD}) during only the predetermined portion (t_1t_2) of each said cycle; and



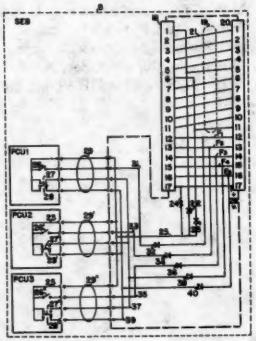
(e) power switching means connected to the clocked ground node (37.5) and for discharging the clocked ground node (37.5) essentially to a second, different predetermined voltage level during only a remaining portion of each said cycle.

4,577,191

MATRIX CONTROL METHOD AND APPARATUS

Robert W. Pargee, Jr., San Clemente, Calif., assignor to EECO Incorporated, Santa Ana, Calif.

PCT No. PCT/US83/01167, § 371 Date Aug. 1, 1983, § 102(e) Date Aug. 1, 1983, PCT Pub. No. WO85/00720, PCT Pub. Date Feb. 14, 1985
PCT Filed Aug. 1, 1983, Ser. No. 524,435
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.79 **12 Claims**



1. The method of controlling a selected use circuit out of a multiplicity of substantially identical sequentially series connected electrical use circuits from a selected control circuit out of the same multiplicity of substantially identical sequentially series connected electrical control circuits that comprises the method steps of;

(a) forming a one for one correspondence between said use circuits in one sequential series connection and between said control circuits in another sequential series connection,

(b) providing a first sequence of clock pulses having plural phases to each said electrical use circuit and also to each

said electrical control circuit, each with all of the phases displaced one phase from circuit to circuit,

(c) providing a second sequence of clock pulses having a number of plural phases mutually prime with respect to the number of plural phases of said first sequence of clock pulses, also to each said electrical use circuit and to each said electrical control circuit, each with all of the phases similarly displaced one phase from circuit to circuit,

(d) successively providing from each said control circuit a unique combination of pulse-coincidences which are carried by a function conductor to the corresponding use circuit, which is simultaneously enabled by correspondingly timed pulses so that actuation of a given said electrical control circuit energizes the corresponding electrical use circuit, and

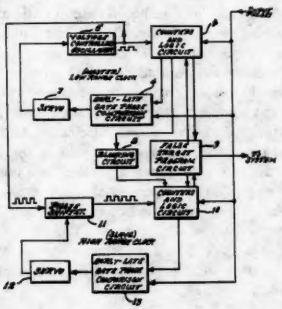
(e) cyclically repeating the unique combination of pulse-coincidence at each said control circuit and the corresponding use circuit by continuously providing said first and second sequences of clock pulses.

4,577,192

ELECTRONIC COUNTERMEASURES FALSE TARGET SYSTEM

Richard J. Wiegand, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 14, 1969, Ser. No. 808,048
Int. Cl.⁴ G01S 7/38
U.S. Cl. 343—18 E **3 Claims**



1. In an electronic countermeasurers deception system wherein radar pulses are generated and transmitted as constituent pulses in reflected threat radar signals, apparatus for adapting to changes in threat radar pulse repetition frequency comprising

a master range clock adapted to operate at a low pulse repetition frequency,

a slave clock adapted to operate at a high pulse repetition frequency,

means for generating and grouping an array of false target pulses around a low pulse repetition frequency radar signal,

means for digitally transferring said array of false target pulses to a high pulse repetition frequency radar signal, and

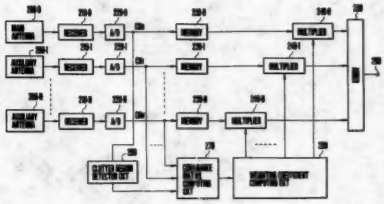
means for phase shifting said transferred array with respect to the master range clock rate.

4,577,193

COHERENT SIDELOBE CANCELLER FOR RADAR

Eiichi Kiuchi; Hiroshi Sawanaka, and Yuichi Tomita, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 663,464
Claims priority, application Japan, Oct. 19, 1983, 58-195743
Int. Cl.⁴ G01S 3/16, 3/28
U.S. Cl. 343—380 **2 Claims**



1. A coherent sidelobe canceller configured as a linear array antenna system having a digital open-loop configuration comprising:

signal receiver means having (N+1) channels connected to a main antenna and N auxiliary antennas in a one-to-one relationship, for producing radar video signals, N being an integer;

analog-to-digital converter means having (N+1) channels, each channel being connected to a corresponding one of said signal receiver means for converting said radar video signals to digital signals;

a first calculating means connected to all (N+1) channels of said analog-to-digital converter means for calculating a covariance matrix ϕ based on said digital signals from said analog-to-digital converter means;

a second calculating means connected to an output of said first calculating means for calculating a weighting coefficient vector W on the basis of the relationship expressed as $W=\mu\phi^{-1}S^{*}$, where μ is an arbitrary constant, ϕ^{-1} is an inverse matrix of said covariance matrix ϕ and S^{*} is an arbitrary vector, said second calculating means having a plurality of outputs for outputting the components of the vector W;

memory means having (N+1) memory cells, each of said memory cells being connected to a corresponding channel of said analog-to-digital converter means, said memory means for storing and delaying said digital signals of said analog-to-digital converter means until the calculation of said vector W is completed;

multiplier means having (N+1) multipliers, each of said multipliers having one input connected to an output of said corresponding memory cell and another input connected to one of said plurality of outputs of said second calculating means, said multiplier means for multiplying said digital signals stored in said memory cells by said weighting coefficient vector W; and

summing means for summing output signals from said multiplier means to suppress interference signals based on real time processing;

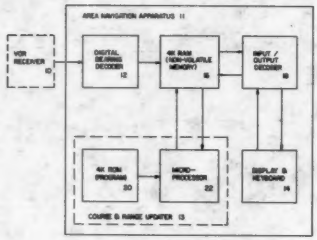
whereby said memory means enables the storage and delay of said ditigal signals until completion of the calculation of said vector W in said second calculating means so as to permit optimization of the time at which said digital signals are input to said multiplier means with respect to the time of input of said weight coefficient vector to thereby adjust for optimizing interference rejection.

4,577,194

AREA NAVIGATIONAL SYSTEM

William A. Ragsdale, League City, Tex., assignor to Intermetrics, Inc., Cambridge, Mass.

Filed Jun. 14, 1983, Ser. No. 504,262
Int. Cl.[4] G01S 1/44
U.S. Cl. 343—401 19 Claims


AREA NAVIGATION APPARATUS 11
VOR RECEIVER 10
DIGITAL BEARING DECODER 12
4K RAM (NON-VOLATILE MEMORY) 16
INPUT / OUTPUT DECODER 18
4K ROM PROGRAMS 20
MICRO-PROCESSOR 22
DISPLAY & KEYBOARD 24
COURSE & RANGE UPDATER 13

1. Apparatus for air navigation to a point of known location which is separated from a VOR beacon of known location, said apparatus comprising:

a storage means for storing signals representative of, respectively, the known locations of said point and said VOR, an estimated ground speed, an estimated range-to-go to said point, and an estimated course to said point;

means for receiving from a VOR signal receiver/VOR bearing generator a signal representative of the current bearing of said VOR beacon from said apparatus;

a bearing change generator responsive to signals generated by said VOR receiver/generator for generating a signal that is representative of the change in the VOR bearing;

a course estimator responsive to signals generated by said bearing change generator and signals in said storage means for generating a signal representative of an updated course heading, said course estimator including,

(a) a first provisional range-to-VOR generator responsive to signals representative of the current estimated course heading and the current VOR bearing for deriving a signal representative of a provisional range-to-VOR,

(b) a second provisional range-to-VOR generator responsive to signals representative of the current estimated ground speed and the change of the VOR bearing for deriving a signal representative of a provisional range-to-VOR,

(c) a range filter for comparing the relationship between said signals representative of said provisional ranges-to-VOR with a predetermined permitted relationship and selecting one of said two signals representative of provisional ranges-to-VOR on the basis of said comparison,

(d) a provisional course generator responsive to the signal representative of the one of said provisional ranges-to-VOR selected on the basis of said comparison for generating a signal representative of a provisional course, and

(e) a course updater responsive to said signal representative of said provisional course for generating a signal representative of an updated course;

a range-to-point estimator responsive to said signal representative of said updated estimated course stored in said storage means for generating a signal representative of the range-to-point, and

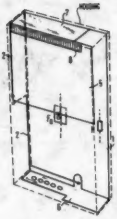
control means for controlling said bearing sampling and for activating said course estimator at predetermined intervals.

4,577,195

MINIATURIZED MOBILE RADIO RECEIVER WITH DIPOLE ANTENNA

Manfred Schwanitz; Dietrich Gaertner; Wolfgang Dressler, all of Berlin, and Joerg Schenk, Pforzheim, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

PCT No. PCT/EP83/00106, § 371 Date Dec. 19, 1983, § 102(e) Date Dec. 19, 1983, PCT Pub. No. WO83/03716, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 16, 1984, Ser. No. 568,239
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214449
Int. Cl.[4] H01Q 1/24
U.S. Cl. 343—702 11 Claims



1. In a miniaturized radio receiver with a housing, said receiver including at least one printed circuit board containing a plurality of components interconnected on said board by means of conductive strips, a dipole antenna having first and second wires directed parallel to one edge of said board with said first wire directed from the top of said edge towards the center of said board and said second wire directed from the bottom of said edge towards the center of said board to create a space between said wires near the center of said board to form a dipole antenna with said base of said antenna positioned near the center of said board, the combination therewith of capacitive loads for said wires comprising:

first and second conductive areas with said first area connected to said first wire at the top of said edge and positioned transverse to said first wire, with said second area connected to said second wire at the bottom of said edge and positioned transverse to said second wire, with each conductive area directed parallel to a corresponding side of said printed circuit board and spaced therefrom to create a predetermined capacitive value for each of said antenna wires, and means coupled to said conductive strips on said board to effectively open said conductive strips near said base of said dipole to block the flow of RF signals.

4,577,196

MISSILE MOUNTED WAVEGUIDE ANTENNA

I-Ping Yu, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 1, 1983, Ser. No. 481,501
Int. Cl.[4] H01Q 13/06
U.S. Cl. 343—705 4 Claims

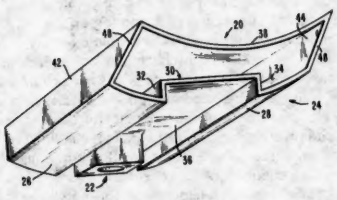
1. A compact microwave antenna for mounting within a recessed free space of a missile, comprising:

a waveguide antenna having two longitudinally parallel broad walls and two longitudinally parallel narrow walls, whereby the cross-sectional area of the antenna is constant over the length of the antenna and whereby the volume of the antenna is adapted to fit entirely within the free space;

one of such broad walls including a generally rectangular ridge; and

the other said broad wall being arcuate in form and most

closely approaching said rectangular ridge at the center of such ridge, whereby a gap is defined between such broad



walls and whereby the arcuate form is adapted to mount with convenience on an interior surface of the free space.

4,577,197

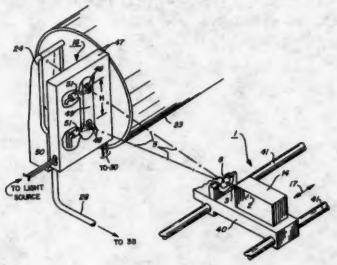
INK JET PRINTER DROPLET HEIGHT SENSING CONTROL

Peter A. Crean, Penfield; David Birnbaum, Pittsford; David B. Feldman, Rochester, all of N.Y.; Frank J. Liptak, Carteret, N.J., and David W. Sewhuk, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1985, Ser. No. 692,260

Int. Cl.[4] G01D *15/18*; H01J *5/16*; G02B *6/04*

U.S. Cl. 346—75 **8 Claims**



1. An improved ink jet printer of the type having a stationary base and a reciprocating printhead mounted on a movable carriage, the printhead having a droplet generator with a single nozzle for producing a single perturbated, continuous stream of ink under pressure that breaks up into droplets at a predetermined distance from the nozzle whereat the droplets are charged in accordance with digitized data signals from a controller for printing swaths of information on a recording medium by sweeping a predetermined series of droplets in one direction, while the droplet generator is reciprocated in another direction, and repeating the carriage reciprocation and droplet sweeping until a completed page of information is printed one swath at a time, the recording medium being incrementally moved a distance equal to the height of one printed swath by a platen after each swath is printed, wherein the improvement comprises:

a height control sensor positioned adjacent at least one end of the platen at a location to sense periodically a test sweep of droplets before or after a swath of information is printed, the sensor having:

(1) a mounting structure fixedly attached to the printer base with an opening therein for the passage of a test sweep of droplets therethrough,

(2) first and second pairs of photodetectors fixedly mounted at predetermined positions on the mounting structure adjacent said opening therein, and

(3) each photodetector pair having an associated light source fixedly mounted on the structure adjacent said opening therein at a location opposite its associated photodetector pair, so that the light sources confront and activate their associated pair of photodectors each of the photodetector pairs generating differential sensing signals in response to the passage of droplets thereby;

circuit means, responsive to said differential sensing signals, for identifying which of the droplets detected by each of the photodector pairs has a trajectory closest to a desired predetermined trajectory, the circuit means generating control signals indicative of whether the identified droplet has the desired trajectory or has one higher or lower; and

means responsive to said control signals for adjusting at least one printer operating parameter in response to the control signals to correct the trajectories of the droplets and thus their interdroplet spacing, so that each subsequently printed swath on the recording medium has a uniformly constant height, thereby enabling the printer to incrementally move the recording medium so that each swath is contiguous to the previously printed swath without pixel gaps or overlaps because all swaths are substantially the same uniform height.

4,577,198

THERMAL TRANSFER PRINTER

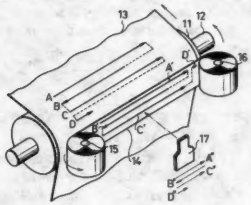
Ikuo Hibino, Takizawa, and Mikio Miyajima, Iwate, both of Japan, assignors to Alps Electric Company, Ltd., Japan

Filed Aug. 24, 1984, Ser. No. 644,494

Claims priority, application Japan, Aug. 24, 1983, 58-155217

Int. Cl.[4] B41J *31/00*

U.S. Cl. 346—76 PH **7 Claims**



1. A printer comprising:

a platen for holding a sheet of print paper thereagainst;

means for advancing said platen and the print paper incrementally in successive line feeding;

a print head movable axially along said platen for bidirectional printing in opposite first and second directions;

an ink tape having a stretch thereof facing said platen for being advanced and pressed against said sheet of print paper by said print head in successive printing operations, said ink tape having a width allowing printing along at least two transversely spaced lines thereon; and

means for positioning a stretch on one line of said tape in front of said print head and advancing said tape in the first direction as said print head is moved in the first direction for printing, and following a line feed of said print paper, for positioning a stretch on a second line of said tape in front of said print head and advancing said tape in the second, opposite direction as said print head is moved in the second direction for printing; and

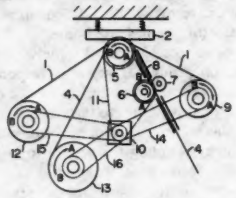
means for winding the tape a selected length after printing thereon in said first and second directions in order to bring a fresh section of said tape to a starting position for subsequent bidirectional printing.

4,577,199

THERMAL TRANSFER RECORDING APPARATUS

Eisaku Saiki; Satoshi Kawamura, both of Yokohama, and Masataka Kawauchi, Ishioka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,809
Claims priority, application Japan, May 23, 1983, 58-89129
Int. Cl.[4] B41J *35/10, 3/20*
U.S. Cl. 346—76 PH 17 Claims



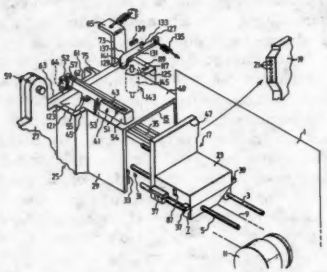
1. A thermal transfer recording apparatus comprising a carrier having a record forming material on its surface, a recording medium, a thermal head having heating elements, and a recording section including means for pressing said carrier and said recording medium against each other; carrier mounting means and recording medium mounting means for mounting said carrier and said recording medium independently of each other on an upstream side of said recording section; carrier mounting means for mounting said carrier on a downstream side of said recording section; conveying means for conveying said recording medium on the downstream side of said recording section; a conveying mechanism capable of conveying said carrier and said recording medium in a normal direction and in a reverse direction; and means for applying tension to the carrier and the recording medium upon feeding said carrier and said recording medium in said normal direction and in said reverse direction, said tension applying means being provided on the upstream and downstream sides of said recording section.

4,577,200

CASSETTE FOR THE INK JET PRINTER OF AN OFFICE MACHINE

Albert Rix, Wilhelmshaven; Horst Martens, Varel; Dieter Drogi, Wilhelmshaven; Klaus-Dieter Frerichs, and Wolfgang Leschik, both of Schortens, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 672,178
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342894
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 21 Claims



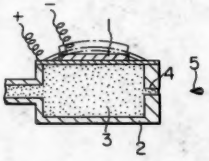
1. An ink jet printing head cassette assembly comprising an ink jet printing head for use in an office machine equipped with a carriage for moving said printing head past a record carrier during a printing operation, the carriage being provided with holding elements for holding said printing head and the carriage being arranged for moving said printing head into a rest position at the conclusion of a printing operation, the machine further being equipped with a receptacle having holding members and with means for establishing electrical, mechanical and ink supply plug-in connections with said printing head when said printing head is mounted on the carriage, said assembly further comprising: a housing arranged to be inserted, together with said printing head, into the receptacle when said assembly is installed in the office machine so that said housing is held by the holding members of the receptacle and said printing head is held by the holding elements of the carriage, said housing being disposed for receiving and protecting said printing head when said printing head is in said rest position and when said housing is removed from the receptacle; and holding means associated with said housing and said printing head for securely holding said printing head in said housing when said housing is removed from the receptacle.

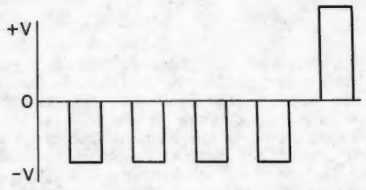
4,577,201

FLUID DROPLET EJECTING SYSTEM

Kiyotaka Murakami, Hino, and Yoshiaki Kimura, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,132
Claims priority, application Japan, Feb. 5, 1983, 58-18460
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 10 Claims





1. In an on-demand type ink-jet recording apparatus comprising:

an ink-jet printer head including an ink chamber,

a polarized piezoelectric element coupled to said ink chamber, said piezoelectric element being polarized as a result of application of a voltage of given polarity thereacross to thereby effect a polarization treatment thereof,

a nozzle in communication with said ink chamber and from which an ink droplet is to be ejected,

an ink supplying passage through which ink is supplied to the ink chamber, and

means for applying to said piezoelectric element a droplet-ejecting pulse voltage of only the opposite polarity to that used in said polarization treatment for ejecting an ink droplet from said nozzle for recording on a recording medium,

the improvement comprising:

means for applying to said piezoelectric element at least one

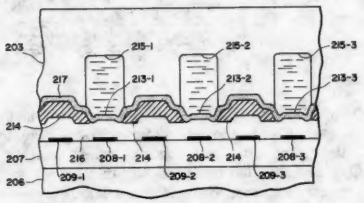
polarization-loss-preventing pulse of the same polarity as that used in said polarization treatment at predetermined points of time not for recording but to prevent loss of polarization of said piezoelectric element due to application of said opposite polarity droplet-ejecting pulses, said at least one polarization-loss-preventing pulse being applied after application of a plurality of said droplet-ejecting pulses.

4,577,202

LIQUID JET RECORDING HEAD

Toshitami Hara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,981
Claims priority, application Japan, Dec. 11, 1982, 57-217582
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **34 Claims**



1. A liquid jet recording head, comprising:

a liquid discharging section having an orifice for discharging liquid in liquid droplets and a liquid pathway connected to said orifice, said liquid pathway having a heat acting portion for applying heat energy to liquid in said portion for forming liquid droplets;

a liquid chamber for storage of liquid to be supplied to said liquid pathway;

an electro-thermal transducer including at least a pair of confronting electrodes connected electrically to a heat generating resistance layer provided on a substrate for forming a heat generating section between said electrodes, at least one of said electrodes having a least a portion thereof underlying said liquid chamber; and

an upper layer on at least said portion of said one electrode and including a first layer comprising an inorganic dielectric material, a second layer comprising an organic material and a third layer comprising an inorganic material, laminated in this order from the surface of said one electrode.

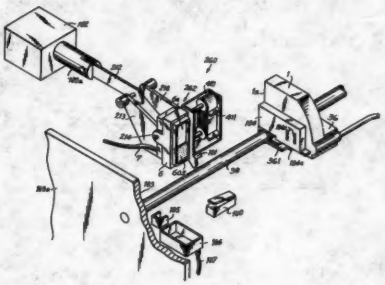
4,577,203

INK JET RECORDING APPARATUS

Yoshikazu Kawamura, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Continuation of Ser. No. 425,767, Sep. 28, 1982, abandoned. This application Aug. 7, 1985, Ser. No. 763,324
Claims priority, application Japan, Sep. 30, 1981, 56-155209; Aug. 13, 1982, 57-141297
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **50 Claims**

1. An ink jet recording apparatus for projecting ink onto a recording medium comprising an ink jet head adapted to receive ink having an ejection nozzle means for ejecting said ink out of said ink jet head towards said recording medium, ink tank means for storing said ink and for supplying said stored ink to said ink jet head, switching means for selectively switching between a first condition where said ink tank means is in fluid communication with said ink jet head so that ink stored in said ink tank means can be supplied to said ink jet head and a second condition where said ink jet head is vented to atmosphere, cap means for selectively covering said ejection nozzle means, suction means for creating a negative pressure in said cap means, and control means for controlling the operation of said switching means, suction means and cap means during a printing start operation and a printing operation, ink stored in said ink tank means being supplied to said ink jet head when said switching means is in said first condition during said printing operation, said cap means covering said ejection nozzle means when said printing operation is completed, said cap means selectively drawing ink and air out of said ink jet head through said ejection nozzle means in response to the negative



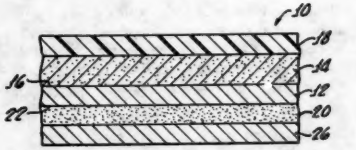
pressure created by said suction means, said cap means essentially clearing said ink jet head of ink when said switching means is in said second condition whereby ink clogging and corrosion during said no print condition can be essentially prevented, said cap means being removed from said ejection nozzle means and said printing operation commences when said switching means is in said first condition during said printing start operation, said suction means refilling said ink jet head with ink and said printing operation commencing after said switching means switches from said second condition to said first condition when said switching means is initially in said second condition during said printing start operation.

4,577,204

THERMOSENSITIVE RECORDING LABEL

Tomoo Shibata, Irvine, and Wissam J. Jurdi, Anaheim, both of Calif., assignors to Ricoh Electronics, Inc., Santa Ana, Calif.

Filed May 25, 1984, Ser. No. 614,287
Int. Cl.⁴ B41M *5/18*
U.S. Cl. 346—200 **12 Claims**



1. A thermosensitive recording label comprising:

a substrate;

a thermosensitive color-forming layer disposed on one side of said substrate, said thermosensitive color-forming layer comprising a colorless or lightcolored leuco dye and acidic substance capable of causing said leuco dye to udnergo color formation upon heating of the thermosensitive recording label;

a protective layer disposed on said thermosensitive color-forming layer;

a pressure-sensitive hot melt adhesive layer disposed on another side of said substrate said pressure-sensitive hot melt adhesive layer comprising at least one adhesive agent

selected from the group consisting of a styrene-butadiene rubber hot melt adhesive and an acrylic hot melt adhesive, and,

a releasable backing sheet disposed on said pressure-sentitive adhesive layer.

4,577,205

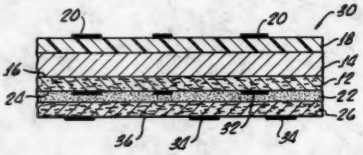
RELEASABLE HEAT-SENSITIVE LABEL WITH E. B. SETTING PRINTING INK

Tomoo Shibata, Irvine, and Wissam J. Jurdi, Anaheim, both of Calif., assignors to Ricoh Electronics, Inc., Santa Ana, Calif.

Filed May 25, 1984, Ser. No. 614,307

Int. Cl.[4] B41M 5/18

U.S. Cl. 346—204 **10 Claims**



1. A thermosensitive recording label, comprising:

a substrate;

a thermosensitive color-forming layer disposed on one side of said substrate, said thermosensitive color-forming layer comprising a colorless or light-colored leuco dye and an acidic substance capable of causing said leuco dye to undergo color formation upon heating of the thermosensitive recording label;

a protective layer disposed on said thermosensitive color-forming layer;

electron beam setting printing ink disposed in a preselected pattern on said protective layer;

a pressure-sensitive adhesive layer disposed on another side of said substrate;

a releasable backing sheet disposed on said pressure-sensitive adhesive layer; and,

electron beam setting printing ink disposed in a preselected pattern on said releasable backing sheet,

said electron beam setting printing ink consisting essentially of a prepolymer, a monomer and a pigment, said prepolymer being a member of the group comprising unsaturated polyesters, vinyloxyethylacrylate, urethane-acrylates, epoxy-acrylates, and dicyclopentadiene acrylates, said monomer being a member of the group comprising acrylic acid esters, methacrylic acid esters, aryl compounds and styrene;

said electron beam setting printing ink having sufficient density and thickness to enable an observable pattern to appeal upon setting of the electron beam setting printing ink during exposure to an electron beam.

4,577,206

PEN RECORDING APPARATUS

Masaaki Hibino, Yokkaichi, Japan, assignor to Brother Industries, Ltd., Nagoya, Japan

Filed Mar. 7, 1985, Ser. No. 708,979

Claims priority, application Japan, Mar. 12, 1984, 59-47972

Int. Cl.[4] G01D 9/30

U.S. Cl. 346—139 R **4 Claims**

1. A pen recording apparatus comprising:

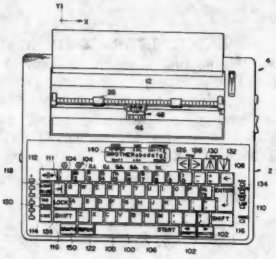
(a) sheet holding means for holding a recording sheet in position;

(b) pen selection means for arbitrarily selecting one of a plurality of types of pen and positioning same in a writing position;

(c) pen holding means for holding at least the pen disposed in the writing position;

(d) a writing control device for moving the pen holding means and the recording sheet relative to each other in two axial directions which intersect each other causing the pen disposed in the writing position to record characters, symbols, graphs, etc., on the recording sheet;

(e) switch means for switching the recording apparatus between a typing mode in which characters, symbols, etc., are typed and a graphic mode in which graphs are drawn;



(f) a memory for storing the pen disposed in the writing position when the recording apparatus is switched from the typing mode to the graphic mode; and

(g) a pen selection means control unit for actuating the pen selection means, when the recording apparatus is switched from the graphic mode to the typing mode, in such a manner that the pen stored in the memory is disposed in the writing position.

4,577,207

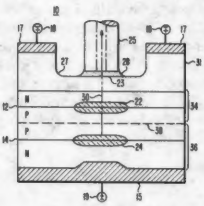
DUAL WAVELENGTH OPTICAL SOURCE

John A. Copeland, Dunwoody, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1982, Ser. No. 454,550

Int. Cl.[4] H01L 33/00

U.S. Cl. 357—17 **3 Claims**



1. A dual wavelength optical source comprising

a monolithic integrated pair of series-opposition connected diodes including

a first diode formed in a first homogeneous material having a first energy band gap and being doped with n and p type impurities as a homojunction for producing light at a first wavelength,

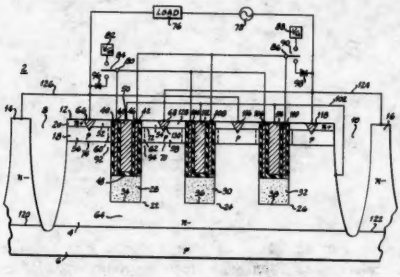
a second diode formed adjacent to the first diode in a second homogeneous material having a second energy band gap and being doped with p and n type impurities as another homojunction for producing light at a second wavelength, and

means interconnected with the first and second diodes for reversing polarity of a common bias current conducted through the first and second diodes and thereby alternatively activating light emission of the first and second wavelengths, respectively, from the first and second diodes along a common path out of the diodes.

4,577,208
BIDIRECTIONAL POWER FET WITH INTEGRAL AVALANCHE PROTECTION

Herman P. Schutten, Milwaukee, Wis.; Robert W. Lade, Fort Myers, Fla., and James A. Benjamin, Waukesha, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 23, 1982, Ser. No. 421,932
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 19 Claims



1. A bidirectional FET, comprising:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of said one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

gate electrode means disposed proximate said first and second channel regions and adapted for application of electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in at least a portion of said first and second channel regions;

whereby upon application of voltage of either polarity to said first and second source regions, electric current can flow in a respective corresponding direction between them, under control of said electrical potential of said gate electode means;

said FET having an OFF state in the absence of said electric gate potential, with the junction between said drift region and one of said channel regions blocking current flow toward one of said source regions, and with the junction between said drift region and the other of said channel regions blocking current flow toward the other of said source regions, said single drift region supporting OFF state blocking voltage in both directions; and

integral avalanche protection means in parallel with said last mentioned blocking junctions and having a lower reverse breakover threshold for protecting the latter in said OFF state;

wherein said integral avalanche protection means comprises:

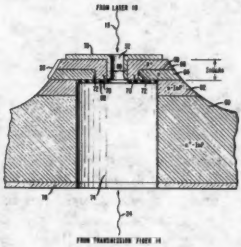
first and second isolation regions of said one conductivity type laterally spaced and separated from said source regions, channel regions and drift region by respective isolation moats, and means connecting each of said first and second isolation regions to a respective on of said source regions; and

a common region of said opposite conductivity type forming bypass junctions with said first and second isolation regions to provide an integral bypass current path around said blocking junctions between said channel regions and said drift region, said bypass junctions having a lower reverse breakover voltage threshold than said blocking junction.

4,577,209
PHOTODIODES HAVING A HOLE EXTENDING THERETHROUGH

Stephen R. Forrest, Chatham, and Richard L. Panock, Cranford, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 416,467, Sep. 10, 1982. This application Sep. 25, 1984, Ser. No. 653,885
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 9 Claims



1. A photodiode comprising

a relatively wide bandgap semiconductor body of one conductivity type,

a first layer of said one conductivity type formed on said body, said first layer having a narrower bandgap than said body,

a second layer of the opposite conductivity type contiguous with said first layer and having a narrower bandgap than said body, thereby forming a p-n junction at the interface between said layers,

said layers having a first hole which extends therethrough,

said second layer having a segment which extends along the inside of said hole, so that said p-n junction does not intersect said hole,

said body having a second hole which extends therethrough and is axially aligned with said first hole, said second hole having a larger diameter than said first hole, and

means forming electrical contacts to said photodiode.

4,577,210
CONTROLLED RECTIFIER HAVING RING GATE WITH INTERNAL PROTRUSION FOR DV/DT CONTROL

John M. Gault, Manhattan Beach, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Aug. 12, 1982, Ser. No. 407,435
Int. Cl.[4] H01L *23/48, 27/24, 29/10*
U.S. Cl. 357—38 6 Claims

1. A controlled rectifier having a ring gate and an increased resistance to dV/dt turn-on; said controlled rectifier comprising a wafer of monocrystalline semiconductor material having generally flat parallel first and second surfaces; said first surface containing a central emitter diffusion region having a generally flat cathode contact secured thereto; said emitter region being of one of the conductivity types; said emitter region being formed in and surrounded at said first surface by a second region which is of the other of the conductivity types; said emitter region having a short peripheral portion extending from its outer periphery; and a ring-shaped gate contact disposed on said first surface and surrounding and radially spaced from the exterior of said central emitter diffusion region and from the exterior of said flat cathode contact; said ring-shaped

gate having an exterior periphery and an interior periphery; said ring-shaped gate contact having a short peripheral portion thereof extending from said interior periphery and electrically connected at said first surface to said short peripheral extending portion of the outer periphery of said central emitter diffusion region, thereby to provide a non-injecting current path for distributed capacitance current which flows from said ring

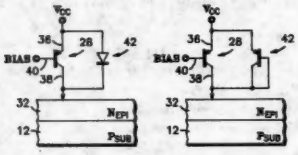
gate during the application of forward biasing voltage to said controlled rectifier and further including an auxiliary emitter region in said first surface; said auxiliary emitter region at least partly underlying and connected to said ring gate and being spaced from said central emitter diffusion region; and an auxiliary gate connected to said first surface at a point spaced from said auxiliary emitter region.

4,577,211

INTEGRATED CIRCUIT AND METHOD FOR BIASING AN EPITAXIAL LAYER

Byron G. Bynum, and David L. Cave, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1984, Ser. No. 596,120
Int. Cl.[4] H01L *29/72*; H03K *3/26*
U.S. Cl. 357—34 **12 Claims**



1. A circuit for biasing a first portion of an impurity region of an integrated circuit to a voltage level substantially equal to a supply voltage level comprising:

a contact transistor formed within a second isolated portion of said impurity region and having first, second and third contact leads thereto, said first contact lead being coupled to a supply voltage line, said second contact lead being coupled to a bias voltage line and said third contact lead being connected to said first portion of said impurity region; and

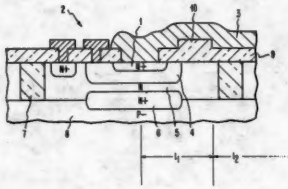
a shunt diode having anode and cathod terminals thereof, said anode and cathod terminals being respectively connected to said first and third contact leads of said contact transistor.

4,577,212

STRUCTURE FOR INHIBITING FORWARD BIAS BETA DEGRADATION

Gary R. Hueckel, Wappingers Falls, and George S. Prokop, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,274
Int. Cl.[4] H01L *29/52, 29/54, 23/50*
U.S. Cl. 357—68 **4 Claims**



1. In a bipolar transistor susceptible to forward bias beta degradation associated with electromigration-induced emitter contact stress, means for alleviating said stress at said emitter, said means comprising emitter contact, insulated metallurgy means for concentrating electromigration-induced stress in said metallurgy in an area adjacent to the area of contact between said metallurgy and said emitter,

said insulated metallurgy means comprising,

a layer of insulating material through which an opening is formed for contacting said emitter and metallurgy on said insulating layer for contacting said emitter through said opening,

said layer having an area of increased thickness adjacent to said opening,

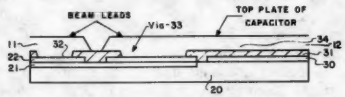
said metallurgy contacting said emitter through said opening after traversing said area.

4,577,213

INTERNALLY MATCHED SCHOTTKY BARRIER BEAM LEAD DIODE

Paul E. Bauhahn, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 5, 1984, Ser. No. 586,161
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—69 **9 Claims**



1. A gallium arsenide millimeter-wave internally matched Schottky barrier beam lead diode comprising:

a beam lead Schottky diode structure fabricated on a chip having a Schottky contact beam lead portion and an ohmic beam lead portion, said Schottky diode at said millimeter wave frequencies exhibiting unwanted but inherent parasitic reactance and lead inductive reactance; and,

a matching reactive shunt path comprising in series an inductor and a capacitor fabricated on said chip adjacent said Schottky diode structure and coupled from said ohmic beam lead to said Schottky contact beam lead.

4,577,214

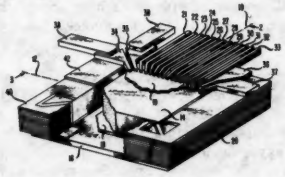
LOW-INDUCTANCE POWER/GROUND DISTRIBUTION IN A PACKAGE FOR A SEMICONDUCTOR CHIP

Leonard W. Schaper, West Orange, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 261,037, May 6, 1981, abandoned. This application Mar. 2, 1984, Ser. No. 584,299

Int. Cl.[4] H01L *23/48, 29/44, 23/02*

U.S. Cl. 357—74 4 Claims



1. In combination,

a semiconductor chip including conductive pads on one main surface thereof, said pads including multiple power pads and multiple ground pads,

a package for said chip comprising a body member defining an interior cavity,

means for mounting said chip within the interior cavity defined by said body member,

closely spaced-apart planar ground and power members formed in parallel planes in said package said members substantially surrounding said cavity and extending around said chip, and, said members each having outer peripheral portions and inner peripheral portions, said inner portions in close proximity to said chip,

only a single pair of power supply terminal members emanating from said package, said pair of terminal members consisting of a single power terminal member and a single ground terminal member, said single power terminal member being connected within said package to an outer peripheral portion of said planar power member and said single ground terminal member being connected within said package to an outer peripheral portion of said planar ground member, said single pair of power supply terminal members being adapted to be connected to the respective terminals of an external power supply,

multiple link members within said package respectively connecting inner peripheral portions of said planar power member to said power pads on said chip,

and multiple link members within said package respectively connecting inner peripheral portions of said planar ground member to said ground pads on said chip.

4,577,215

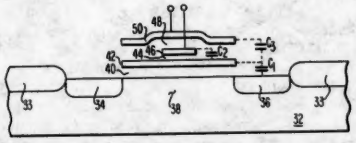
DUAL WORD LINE, ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

Roger G. Stewart, Neshanic Station, and Alfred C. Ipri, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 18, 1983, Ser. No. 467,643

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.5 5 Claims



1. A non-volatile electrically erasable, programmable floating gate memory device having a body of semiconductor material of a first conductivity type with extended, parallel source and drain regions of a second conductivity type embedded in the body of semiconductor material at a surface thereof and spaced one from the other to define a channel region, a conductive floating gate member oriented parallel to said surface and insulated from the substrate and having a portion thereof disposed over the channel region, a conductive program line having a portion thereof disposed over and insulated from the floating gate member and a conductive word line disposed over and insulated from the conductive program line, comprising:

a portion of the floating gate being oriented in a direction parallel to the extended source and drain regions and aligned with the channel region;

the program line being disposed under and parallel to the word line over the channel region with both lines perpendicularly disposed with respect to the orientation of the floating gate;

the ends of the floating gate being aligned with the width of the word line; and

the capacitance values of the floating gate, the word and program lines and the substrate having the relationship:

$$C_2 < C_3 > C_1$$

where:

C_1 = the floating gate-to-substrate capacitance,

C_2 = the program line-to-floating gate capacitance; and

C_3 = the word line-to-floating gate capacitance.

4,577,216

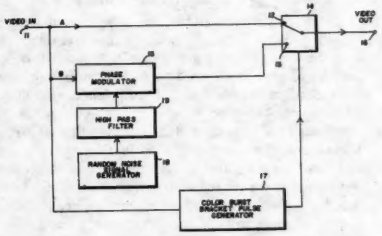
METHOD AND APPARATUS FOR MODIFYING THE COLOR BURST TO PROHIBIT VIDEOTAPE RECORDING

John O. Ryan, Cupertino, Calif., assignor to Macrovision, San Jose, Calif.

Filed Nov. 14, 1983, Ser. No. 551,696

Int. Cl.[4] H04N *9/45, 9/80, 7/167, 5/78*

U.S. Cl. 358—19 14 Claims



1. A method for modifying a color video signal of the type wherein color information is transmitted on a subcarrier, the color video signal also including a color burst signal for generating in a television receiver a subcarrier signal at a reference phase for use in demodulating the color information, the method comprising the step of phase modulating the color burst signal with a noise signal to produce a modified color video signal, whereby the modified signal produces a normal color picture on a television receiver while a videotape recording made from the modified signal exhibits color interference.

4,577,217
ENCODING CIRCUIT FOR A SECAM COLOR TELEVISION TRANSMISSION

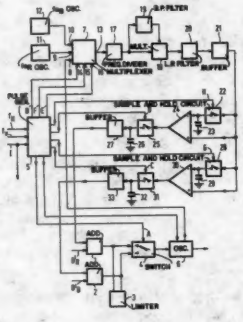
Henricus W. G. Haenen, and Antonie van Leeuwen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1983, Ser. No. 469,543

Claims priority, application Netherlands, Mar. 23, 1982, 8201188

Int. Cl.⁴ H04N *9/40*

U.S. Cl. 358—14 **7 Claims**



1. An encoding circuit for a SECAM color television transmitter in which two line-sequential color difference signals modulate a color subcarrier signal generated by a frequency-modulatable oscillator, the generated subcarrier signal being at a first quiescent frequency during scanning line periods of the first color difference signal and at a second quiescent frequency during scanning line periods of the second color difference signal, the modulated subcarrier signal being at the quiescent frequency corresponding to any scanning line period during a blanking interval thereof in which the relevant color-difference signal is zero, such encoding circuit comprising:

means for generating a first reference signal at a frequency which is a reference for said first quiescent frequency and a second reference signal at a frequency which is a reference for said second quiescent frequency;

a frequency demodulator adapted to derive at its output a demodulated voltage of a value dependent on the frequency of a signal applied to its input;

a multiplex circuit connecting said reference signal generating means and said frequency-modulatable oscillator to the input of said frequency demodulator;

pulse generating means adapted to supply switching signals to said multiplex circuit which cause it to apply to the input of said frequency demodulator predetermined sequences of said modulated subcarrier signal and said first and second reference frequency signals during successive scanning line periods;

a first control path connected to the output of said frequency demodulator and responsive to further switching signals supplied by said pulse generating means to a produce a first control voltage by subtracting the demodulated voltage derived from said first reference frequency signal during predetermined scanning line periods from the demodulated voltage derived from said modulated subcarrier signal during the blanking intervals of predetermined scanning line periods when such signal is at said first quiescent frequency;

a second control path connected to the output of said frequency demodulator and responsive to further switching signals supplied by said pulse generating means to produce a second control voltage by subtracting the demodulated voltage derived from said second reference frequency signal during predetermined scanning line periods from the demodulated voltage derived from said modulated subcarrier signal during the blanking intervals of predetermined scanning line periods when such signal is at said second quiescent frequency;

and means connected to each of said control paths for applying said first and second control voltages to said frequency-modulatable oscillator to modify the first and second quiescent frequencies thereof to correspond with said first and second reference frequencies;

the switching signals supplied by said pulse generating means being sequenced so that there is at least one scanning line period between those during which are derived the demodulated voltages which are subtracted to produce each of said control voltages.

4,577,218
COLOR SEPARATING CIRCUIT FOR PRODUCING RED AND BLACK SIGNALS

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

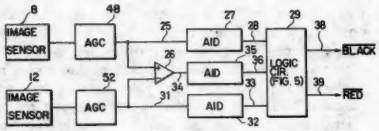
Filed Mar. 18, 1983, Ser. No. 476,759

Claims priority, application Japan, Mar. 19, 1982, 57-42555

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.⁴ H04N *1/46*; G03F *3/08*; G01J *3/511*; G06K *9/46*

U.S. Cl. 358—75 **4 Claims**



1. A color separating circuit system comprising: a reading device having at least two reading elements for scanning the same portion of an original having picture data in different wavelength ranges, and for providing an unfiltered output picture signal and a filtered output picture signal;

signal level adjusting means for adjusting the levels of said output picture signals provided by said reading elements so that said levels are equal to each other when white picture data is read;

arithmetic means for obtaining an output difference signal by computing a level difference between said output picture signals which have been subjected to level adjustment by said signal level adjusting means;

A/D converters for digitizing respectively said output difference signal of said arithmetic means and said adjusted output picture signals provided by said signal level adjusting means; and

a color separation logic circuit for performing the operation of color separation on the outputs of said A/D converters.

4,577,219
METHOD AND AN APPARATUS FOR COPYING RETOUCH IN ELECTRONIC COLOR PICTURE REPRODUCTION

Jürgen Klie, Toekendorf, and Rainer Nehl, Kiel, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,330

Claims priority, application European Pat. Off., Dec. 11, 1982, 82111504.5

Int. Cl.⁴ H04N *1/46*; G03F *3/08*

U.S. Cl. 358—78 **18 Claims**

1. A method for copying retouch of a color image by transferring image information from a read image region of a color image to a write image region of said color image in electronic color image reproduction, wherein original color signals are obtained by scanning of the color image, the original color signals are converted into color values for a plurality of differ-

ent color components of the color signals, and the color values are stored in a storage medium image-point-by-image-point, comprising the steps of:

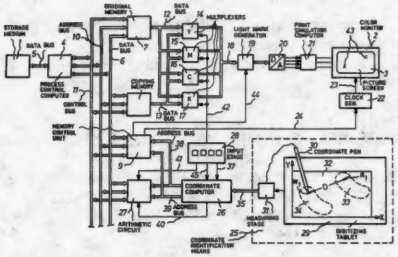
(a) marking an image point as a read point within the read image region of the color image to be retouched, said read image region defining a portion of said color image from which image information is to be taken;

(b) marking an image point as a write point within the write image region of the color image to be retouched, said write image region defining a portion of said color image into which the image information taken from said read image region is to be transferred;

(c) identifying coordinates of said marked read point and said marked write point;

(d) determining a vector distance between said read point and said write point from said identified coordinates of the read point and the write point;

(e) marking the write region in terms of size and shape so as to mark additional image points within the write image



region and identifying the coordinates of said additional image points;

(f) determining coordinates of corresponding additional image points within said read image region from the coordinates of said additional image points within said write image region, said corresponding additional image points within said read image region being in each case spaced from said additional image points within said write image region by said determined vector distance;

(g) generating for at least one of the color components of the image points marked within said write image region substitution color values related to the original color values of the corresponding image points within said read image region; and

(h) replacing said original color values of the image points within said write image region by said substitution color values to obtain a retouched color image within the write image region, whereby a desired copying retouch of the color image is achieved.

4,577,220

ARRANGEMENT FOR DETECTING TO WHICH CHANNEL A TELEVISION SET IS TUNED

Raymond Laxton, Maidenhead, and Peter E. Smith, Reading, both of United Kingdom, assignors to AGB Research PLC, London, England

Filed May 24, 1984, Ser. No. 614,323

Claims priority, application United Kingdom, May 25, 1983, 8314468

Int. Cl.⁴ H04N 7/00

U.S. Cl. 358—84 **6 Claims**

1. A television channel detecting arrangement, for detecting to which channel a television set is tuned, comprising:

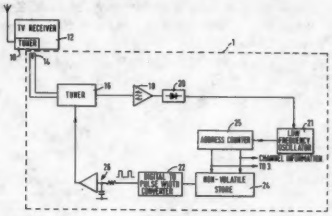
means inductively coupled to a local oscillator of the television set for receiving a local oscillator signal therefrom;

means for storing binary numbers representative of channels to which the television set may be tuned;

means for converting the binary numbers from a digital representation to an analog representation;

means coupled to the digital to analog conversion means for tuning to a plurality of frequencies in accordance with the analog signal;

means for generating a detection signal when the tuning



means is tuned to the frequency of the local oscillator signal; and

means for identifying in response to the detection signal the binary number corresponding to the tuning signal which caused said detection signal to be generated, thereby identifying the channel to which the television set is tuned.

4,577,221

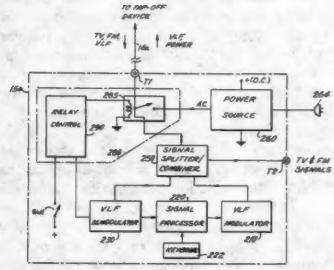
POWER SAFETY DEVICE FOR CATV TAP-OFF UNIT

Russell A. Skinner, Sr., Elizabeth, and Walter S. Ciciora, Englewood, both of Colo., assignors to American Television & Communications Corporation, Englewood, Colo.

Filed Nov. 29, 1984, Ser. No. 676,070

Int. Cl.⁴ H04N 7/10

U.S. Cl. 358—86 **17 Claims**



1. In a cable television system having a tap-off device external to a subscriber premises, the tap-off device connected to the subscriber premises via a drop cable for delivering television signals to the subscriber premises, and the tap-off device including electronic circuitry powered at least in part by a source of subscriber-supplied electrical power which is applied to the drop cable and delivered via the drop cable to the tap-off device, a power safety device comprising:

first means associated with the tap-off device and connected to the drop cable for transmitting a signal to the subscriber premises via the drop cable;

second means associated with the subscriber premises for interrupting the application of power to the drop cable; and

sensing means associated with the subscriber premises for sensing the transmitted signal on the drop cable, said sensing means being connected to said second means and responsive to sensing the absence of the transmitted signal for enabling said second means to interrupt the application

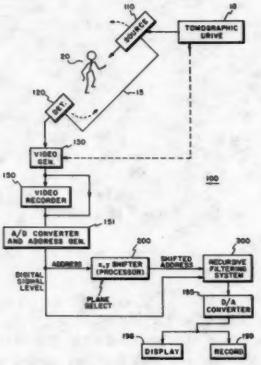
of power to the drop cable to protect individuals from receiving a hazardous electrical shock.

4,577,222

APPARATUS AND METHOD FOR CROSS SECTIONAL IMAGING OF A BODY

Robert A. Kruger, Sandy, and James A. Nelson, Salt Lake City, both of Utah, assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Nov. 26, 1982, Ser. No. 444,613
Int. Cl.[4] H04N 5/32
U.S. Cl. 358—111 **22 Claims**



1. A method for generating a processed image of a cross-section through a body, comprising the steps of:

disposing the body between a combination of a source of radiation and an associated detector, such that a beam of radiation from said source impinges angularly on said body and passes through to said detector;

effecting relative rotational motion between said beam and said body such that a principal plane of interest in said body remains substantially in focus during said relative rotational motion;

deriving from the detector, at different rotational positions, a series of frames of electronic video signals that represent images of the radiation transmission characteristics of the body at a series of successive times;

temporally filtering said series of frames by combining successive frames of the series with a weighting for each combination that depends on when the frames being combined occur in time with respect to each other; and

displaying the temporally filtered series of frames.

4,577,223

SYNTHETIC D.C. RESTORATION OF A.C. COUPLED SIGNALS

Robert C. Fitch, Roseville, and Pat M. Narendra, Mapleplain, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1982, Ser. No. 447,906
Int. Cl.[4] H04N 5/33
U.S. Cl. 358—113 **11 Claims**

1. A method of processing a sequence of a.c. coupled electronic signals, each of duration t, comprising:

selecting a first signal;

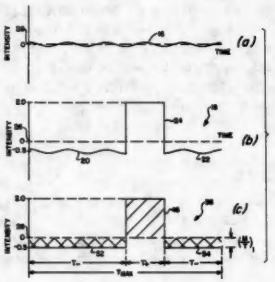
selecting a second signal;

generating a difference signal which is the difference between said first and second signals;

determining a first time which is that portion of t when said first signal exceeds said second signal;

determining a second time which is that portion of t when said second signal exceeds said first signal;

selecting the larger of said first or second times;



generating an average value of said difference signal during said larger time; and

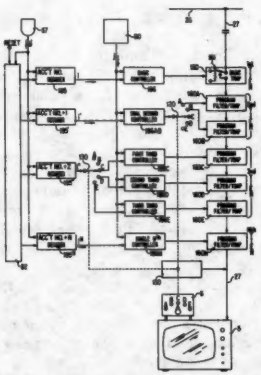
adding said average value to said second signal.

4,577,224

SECURE CABLE TELEVISION ACCESS SYSTEM WITH TIERING CONTROL

Clarence S. Ost, 7905 Bayshore Dr., Margate City, N.J. 08402

Filed Jul. 19, 1982, Ser. No. 399,471
Int. Cl.[4] H04N 7/16, 7/167
U.S. Cl. 358—114 **16 Claims**



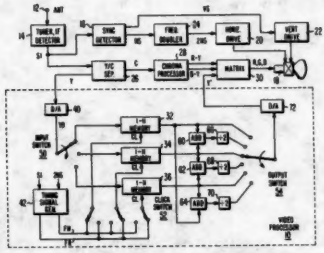
1. Program access tiering control method in a time-addressable access control system for cable TV subscribers, wherein program signals are transmitted via cable to local tapoff interconnections with subscribers' television receivers together with a series of clocking pulses corresponding to sequential arrangement of subscribers, the clocking pulses being accompanied by program access-enabling pulses for program-requesting subscribers, wherein sets of programs are arranged in different levels or tiers, such as according to different levels of subscriber charges, the tiering control method being characterized by including within the transmission to any given subscriber a plurality of clocking pulses time-addressed for such subscriber and corresponding to a plurality of program tiers, and including for any requesting subscriber enabling command pulses for each of the respective tiers so requested, thereby enabling the subscriber to select for reception a program from any such tier so requested and enabled.

4,577,225

PROGRESSIVE SCAN VIDEO PROCESSOR HAVING COMMON MEMORIES FOR VIDEO INTERPOLATION AND SPEED-UP

Dalton H. Pritchard, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 31, 1984, Ser. No. 646,104
Int. Cl.⁴ H04N *7/01, 5/68*
U.S. Cl. 358—140 **6 Claims**



1. A progressive scan processor, comprising:

a source of video input signal;

memory means including three memory locations each having a storage capacity of one line of said video input signal and organized in a parallel arrangement;

memory control means for sequentially causing each one of said memory locations to write in a current line of said video signal a line at a time at a first clock rate and for causing two previously stored lines to be read from two of said memory locations at a second clock rate while said video signal is being written into one of said memory locations to provide two time compressed video output signals; and

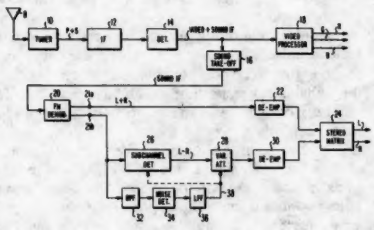
output means coupled to said memory means and responsive to said two time compressed video output signals for providing a processed video output signal in which alternate lines thereof are interpolated from said two time compressed video output signals.

4,577,226

NOISE REDUCTION FOR FM STEREOPHONIC SYSTEMS AND PARTICULARLY USEFUL IN TELEVISION AUDIO SYSTEMS

Jack Avins, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1982, Ser. No. 445,486
Int. Cl.⁴ H04N *7/04, 5/21, 5/60*
U.S. Cl. 358—143 **6 Claims**



1. In a television receiving system including a sound detecting channel having a predetermined bandwidth for recovering a multichannel sound signal including a main signal component, a subcarrier signal component and a pilot signal component, apparatus for reducing the level of noise recovered with said subcarrier signal component comprising:

tuned circuit means having a resonant frequency located between the frequencies occupied by said main and subcarrier signals coupled to be responsive to said recovered sound signal for sensing the noise density in the portion of said predetermined bandwidth of said detecting channel which is around said pilot signal exclusive of said main and subcarrier signal components;

detector means coupled to said tuned circuit means for generating a control signal in response to the level of the sensed noise density in said detecting channel; and

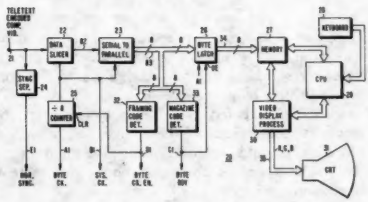
level control means responsive to said control signal for controlling the amplitude level of said subcarrier signal component inversely with respect to the level of said sensed noise density.

4,577,227

TELETEXT FRAMING CODE DETECTOR

Kadagattor V. Gurumurthy, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 18, 1983, Ser. No. 543,034
Int. Cl.⁴ H04N *7/087, 7/08*
U.S. Cl. 358—147 **6 Claims**



1. A teletext decoder capable of detecting a sought after byte of encoded data in the presence of one-bit error, comprising:

a data slicer responsive to an amplitude modulated, teletext encoded composite video signal for generating a serial data stream of logical bits representing a teletext packet, said data stream subject to error in the generation of the bits thereof;

a serial-to-parallel converter for generating bytes of incoming data from said serial data stream;

means for developing, on a plurality of signal lines, signal states representative of respective bits of prime implicant terms associated with said bytes of incoming data; and

a detector stage responsive to the signal states of said signal lines for logically analyzing the prime implicant terms associated with said bytes of incoming data to detect the presence of a prime implicant term associated with the sought after byte of encoded data to provide a detection signal when that byte is present in the serial data stream.

4,577,228

TRANSVERSAL FILTER INCORPORATING MOS-TRANSISTOR AMPLIFIERS

Ikuya Arai; Toshinori Murata, both of Yokohama, and Masafumi Kazumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,667
Claims priority, application Japan, May 27, 1983, 58-92285
Int. Cl.⁴ H04N *5/213;* **H03F** *3/45*
U.S. Cl. 358—167 **2 Claims**

1. A transversal filter used in a ghost canceller of a television receiver comprising:

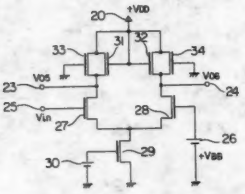
(a) a first amplifier which receives an input video signal and provides a first output video signal in a same polarity as that of said input video signal and a second output video signal having a same amplitude as that of said first output video

signal and a polarity opposite to that of said first output video signal;

(b) a plurality of switches connected to said first amplifier and adapted to conduct selectively the first or second output video signal provided by said first amplifier;

(c) a group of second amplifiers comprising a plurality of variable gain amplifiers connected to said switches correspondingly, each of said variable gain amplifiers having a terminal for receiving a control voltage, by which the amplitude of the first or second output video signal provided by corresponding one of said switches is varied;

(d) group of delay elements comprising a plurality of delay elements connected in cascades, each of said delay elements being connected to a corresponding one of said variable gain



amplifiers of said group of second amplifiers and operable to delay the first or second output video signal provided by said corresponding one variable gain amplifier for a predetermined time length; and

(e) an adder connected to the output of said group of delay elements so as to receive the delayed first or second output video signal and adapted to receive the input video signal so that the delayed first or second output video signal is added to the input video signal,

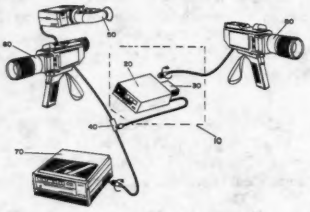
wherein said plurality of variable gain amplifiers of said group of second amplifiers each include an amplifying element formed by a MOS transistor which is loaded by a complementary connection of a P-MOS transistor and an N-MOS transistor constituting a C-MOS transistor pair.

4,577,229

SPECIAL EFFECTS VIDEO SWITCHING DEVICE

Juan de la Cierva, Sr., and Juan de la Cierva, Jr., both of 1450 NW. 78th Ave., Miami, Fla. 33126

Filed Oct. 7, 1983, Ser. No. 540,163
Int. Cl.[4] H04N *5/04, 5/262*
U.S. Cl. 358—182 **4 Claims**



1. A device for mixing video and audio signals originated from at least one remote camera and one director camera, comprising, in operative combination:

A. an internal means for synchronizing said video signals connected to said remote and director cameras; and

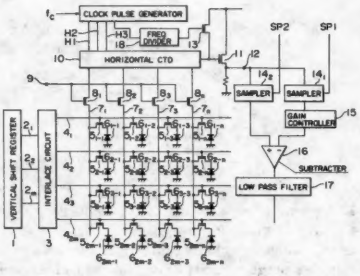
B. Means for combining said video signals connected to said remote and director cameras including removable cartridges having special effects means that are programmed for predetermined video switching patterns, including means for dissolving said video signals and means for mixing said audio signals.

4,577,230

SOLID STATE IMAGING DEVICE

Naoki Ozawa, Kokubunji; Toshiyuki Akiyama, Kodaira; Shusaku Nagahara, Hachioji, and Iwao Takemoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,911
Claims priority, application Japan, Jan. 18, 1984, 59-5576
Int. Cl.[4] H04N *3/12*
U.S. Cl. 358—212 **5 Claims**



1. A solid state imaging device comprising:

a plurality of photoelectric conversion elements arranged regularly in horizontal and vertical directions;

a plurality of vertical signal lines for transferring charges in a vertical direction;

a first group of switches for transferring signal charges which are generated in said photoelectric conversion elements in response to incident light, to predetermined ones of said vertical signal lines;

horizontal transfer means including at least one charge transfer device, said charge transfer device being provided with a set of transfer electrodes capable of transferring two kinds of charges, separately from each other, in a horizontal direction;

a second group of switches for transferring charges on said vertical signal lines from said vertical signal lines to said horizontal transfer means;

pulse generating means for said first group of switches and pulse generating means for said second group of switches, for generating a pulse for controlling said first group switches and a pulse for controlling said second group switches, respectively, so that both smear charges stored on said vertical signal lines and signal charges transferred from said photoelectric conversion elements through said first group switches to said vertical signal lines may be transferred, separately from each other, to said horizontal transfer means;

transfer-pulse generating means for generating a transfer control pulse, said transfer control pulse being applied to said transfer electrodes, to transfer the smear charges and the signal charges, both of which have been transferred to said horizontal transfer means, to an output end separately from each other;

charge-voltage conversion means for converting each smear charge and each signal charge, both of which have been transferred by said horizontal transfer means, into a smear voltage and a signal voltage, respectively;

reset means for resetting the smear charge and the signal charge held by said charge-voltage conversion means, at an interval twice as long as the repetition period of said transfer control pulse; and

subtraction means for producing a difference between said smear charge and said signal charge after at least one of

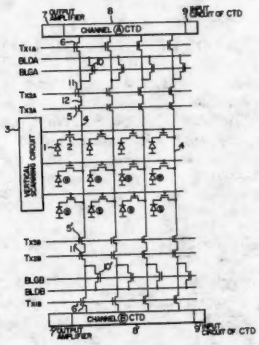
said smear charge and said signal charge has been adjusted in accordance with a predetermined factor.

4,577,231

HIGH SENSITIVITY SOLID-STATE IMAGING DEVICE

Shinya Ohba, Kanagawa; Haruhisa Ando, Hachioji; Masaaki Nakai, Tokorozawa; Toshifumi Ozaki, Tokyo; Koichi Seki, Hachioji; Kenji Takahashi; Toshiyuki Akiyama, both of Kodaira; Iwao Takemoto, Tokyo; Takuya Imaide; Akihide Okuda, both of Yokohama, and Masaharu Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,415
Claims priority, application Japan, Mar. 31, 1982, 57-51215
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—212 8 Claims



1. A high sensitivity solid-state imaging device wherein a photo-sensing section is constructed of a MOS-type sensor in which picture elements each comprised of a photodiode and a switching MOS transistor are arrayed in the form of a matrix, wherein signal outputs of the respective picture elements of said MOS-type sensor are transferred to a CTD (charge transfer device) through vertical signal lines, and wherein the signal outputs are read out by said CTD, said imaging device comprising:

signal-transfer means for causing bias charges to enter into said vertical signal lines so as to mix them with signal charges on said vertical signal lines and for causing the mixed signal charges to be transferred into said CTD, said signal-transfer means including a first gate MOS transistor which is connected between the vertical signal line and said CTD;

reset means for setting a potential of said vertical signal line to a predetermined reference voltage before the bias charges enter into said vertical signal line, said reset means including second and third gate MOS transistors which are connected in series between said first gate MOS transistor and said vertical signal line;

a reset gate element which is connected between a juncture of said first and second gate MOS transistors and a reset-voltage line; and

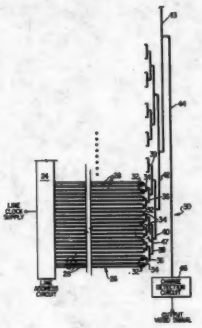
an inverter circuit having a first input terminal thereof connected to a corresponding one of said vertical signal lines, a second input terminal connected to a common voltage line, and an output terminal connected to the gate of the corresponding third gate MOS transistor.

4,577,232

LINE ADDRESSED CHARGE COUPLED IMAGER

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,400
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 15 Claims



1. A charge transfer imager comprising:

an array of charge transfer locations arranged in a plurality of rows;

a buffer register disposed at one end of each said rows for receiving charge propagated from said rows;

output means connected to said buffer register for receiving charge propagated along said buffer register, and

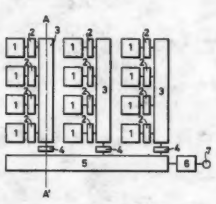
the length of the path traveled by each charge along said buffer register to said output means being equal as measured by number of pixels traveled.

4,577,233

SOLID IMAGE-PICKUP DEVICE

Masafumi Kimata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,198
Claims priority, application Japan, Jun. 1, 1982, 57-95443
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 6 Claims



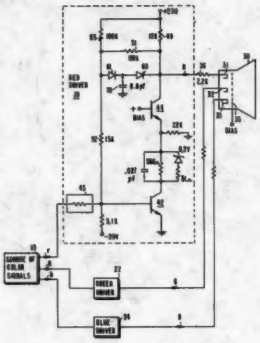
1. A solid image-pickup device having a scanning mechanism for reading and outputting outputs from photo-detectors comprising:

at least one means, forming said scanning mechanism, comprising a charge transferring unit in which a plurality of MOS gates are arranged side by side, and a MOS gate control unit for applying signals to said plurality of MOS gates so as to form potential wells below all said gates of said charge transferring unit at a first period, to inject a signal charge into said potential well at a second period, and to successively remove said potential wells in a direction of said charge transferring so as to move said signal charges below said MOS gates of said charge transferring unit at a third period.

4,577,234
DRIVER AMPLIFIER FOR AN IMAGE DISPLAY DEVICE

Wayne E. Harlan, Marion, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1983, Ser. No. 547,325
Int. Cl.[4] H04N *5/68, 9/16*
U.S. Cl. 358—243 13 Claims



1. A video signal processing system comprising:

a source of video signals;

an image display device for displaying video information in response to video signals applied to an intensity control electrode thereof;

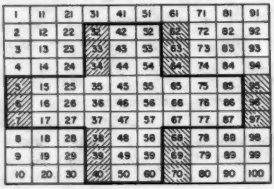
a video output driver amplifier with a signal input coupled to said video signal source and a signal output from which amplified video signals are provided to said intensity control electrode of said display device, said amplifier being subject to exhibiting a saturated state in response to large amplitude video signals processed by said amplifier between said signal input and said signal output; and

threshold control means coupled to said amplifier and selectively responsive to said video signals processed by said amplifier for reducing the signal gain of said amplifier in response to said large amplitude processed video signals exceeding a threshold level, to preclude said amplifier exhibiting said saturated state.

4,577,235
TEXT/CONTINUOUS TONE IMAGE DECISION PROCESSOR

Henry N. Kannapell, Raleigh, N.C., and Paul G. Nietfeld, San Antonio, Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 20, 1984, Ser. No. 642,605
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 20 Claims



1. A method for determining whether portions of an image represented by image data obtained by scanning said image correspond to text or continuous tone, said method comprising the steps of:

partitioning said image data into contiguous image data blocks;

determining an average grayscale value for each of said image data blocks;

determining at least one additional characteristic for each of said image data blocks;

utilizing each possible average grayscale value as an indexing variable;

generating a one dimensional Gaussian distribution to distribute said at least one additional characteristic for each of said average grayscale values for text data;

determining the mean and standard deviation for each text data distribution;

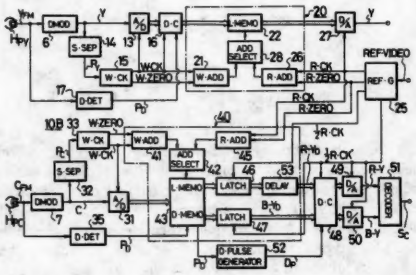
calculating the Mahalanobis distance for each additional characteristic data value for each image data block to determine a measure of the distance from the mean for that characteristic of the corresponding data block and, hence, a representative text probability of whether said data block corresponds to a text portion of said image; and

determining whether said data blocks correspond to text or continuous tone portions of said image based on said representative text probabilities.

4,577,236
APPARATUS FOR REPRODUCING A COLOR VIDEO SIGNAL

Kenji Takanashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,190
Claims priority, application Japan, Jun. 29, 1982, 57-111884
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—320 15 Claims



1. Apparatus for reproducing a color video signal from a recording medium on which a luminance component is recorded in a first channel and at least two chrominance components are recorded in a second channel such that the chrominance components are tire-compressed and successively recorded in cyclically repeated fashion, comprising:

means for generating a first write clock in response to a first synchronizing signal contained in said luminance component;

means for generating a second write clock in response to a second synchronizing signal contained in one of said chrominance components;

first memory means for storing said luminance component reproduced from said first channel in synchronism with said first write clock;

second memory means for storing said chrominance components reproduced from said second channel in synchronism with said second write clock;

reference clock generator means for generating a reference clock supplied to said first and second memory means;

means for reading out said luminance component from said first memory means in response to said reference clock; and

means for reading out said chrominance components from said second memory means in accordance with said reference clock to thereby time-expand said chrominance components and simultaneously synchronize said chrominance components with said luminance component.

4,577,237

ERROR CORRECTION IN DIGITAL TELEVISION SIGNALS

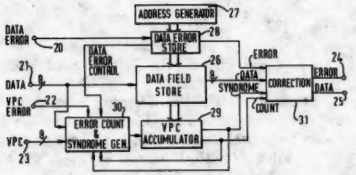
Mark C. Collins, Basingstoke, England, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,874

Claims priority, application United Kingdom, Aug. 20, 1982, 8224013

Int. Cl.[4] H04N *5/782*

U.S. Cl. 358—336 **8 Claims**



1. A method of error correction of a digital television signal consisting of sequential data words, the method comprising the steps of:

selecting a predetermined number of said data words;

deriving a parity word from the selected data words;

forming a correction unit including said selected data words and said parity word;

recording said correction unit;

reproducing said correction unit for slow motion display;

identifying validly reproduced ones and invalidly reproduced ones of the reproduced words of the reproduced correction unit, and flagging each word identified as being invalidly reproduced;

deriving a syndrome from the reproduced parity word and selected ones of the reproduced data words, said syndrome being equal to zero when all said reproduced words are validly reproduced;

counting the number of said validly reproduced words; and

performing alternative error correction steps in dependence on said number of validly reproduced words, said alternative error correction steps including:

when said number of reproduced words identified as being valid is one less than said predetermined number, such that only one reproduced data word is invalidly reproduced, using said syndrome to correct the one invalidly reproduced word; and

when said number of reproduced words identified as being valid equals said predetermined number and said syndrome does not equal zero, flagging each of said reproduced data words as being in error.

4,577,238

CIRCUIT FOR REDUCING INTERMODULATION DISTORTION IN A FREQUENCY-MODULATED SIGNAL

Yasuaki Watanabe, Kasukabe, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

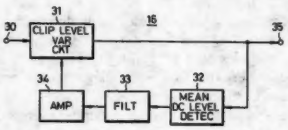
Filed Apr. 22, 1983, Ser. No. 487,686

Claims priority, application Japan, Apr. 30, 1982, 57-73543

Int. Cl.[4] H04N *5/91, 5/213;* **H03B** *19/00, 1/00;* **H04B** *1/10*

U.S. Cl. 358—340 **6 Claims**

1. An intermodulation distortion reducing circuit for a frequency-modulated signal, said intermodulation distortion reducing circuit comprising: a sinusoidal wave shaping circuit supplied with an input frequency-modulated signal including an intermodulation distortion component for shaping a carrier waveform of said input frequency-modulated signal into a waveform closely approximating a sinusoidal wave; and a mean DC level detecting circuit supplied with an output signal of said sinusoidal wave shaping circuit, for detecting a mean DC level of said output signal of said sinusoidal wave shaping circuit and producing a detection output, said sinusoidal wave



shaping circuit being supplied with the detection output of said mean DC level detecting circuit and a waveform shaping quantity of said sinusoidal wave shaping circuit being varied to obtain a carrier waveform which closely approximates a sinusoidal waveform having a duty cycle of 50%, to produce a frequency-modulated signal having a waveform closely approximating a sinusoidal waveform with its intermodulation distortion component reduced.

4,577,239

VIDEO TAPE RECORDER USABLE WITH DIFFERENT TYPES OF TAPE CASSETTES

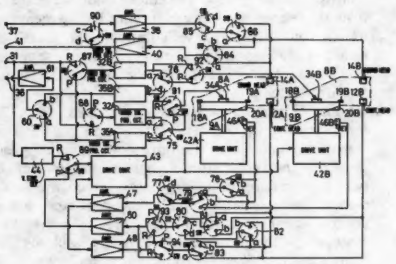
Katsuya Sougen, Tokyo, Japan, assignor to AIWA Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,572

Claims priority, application Japan, Nov. 12, 1980, 55-158189

Int. Cl.[4] G11B *5/86, 15/46;* **H04N** *5/78*

U.S. Cl. 360—15 **1 Claim**



1. A video cassette tape recorder comprising:

a case;

a VHS-system tape cassette loading unit mounted on the case;

a beta-system cassette loading unit mounted on the case;

first drive means disposed within the case, for driving a VHS-system tape loaded on the VHS-system tape loading unit;

second drive means disposed within the case, for driving a beta-system tape loaded on the beta-system tape loading unit;

first video signal reproducing means disposed within the case for reproducing first video signals recorded on the VHS-system tape;

second video signal reproducing means disposed within the case, for reproducing second video signals recorded on the beta-system tape;

first sound signal reproducing means disposed within the case, for reproducing first sound signals recorded on the VHS-system tape;

second sound signal reproducing means disposed within the

case, for reproducing second signals recorded on the beta-system tape;

first video signal recording means disposed within the case, for recording the first video signals available from the first video signal reproducing means on the beta-system tape;

second video signal recording means disposed within the case, for recording the second video signals available from the second video signal reproducing means on the VHS-system tape;

first sound signal recording means disposed within the case, for recording the first sound signals available from the first sound signal reproducing means on the beta-system tape, when the first video signals are recorded on the beta-system tape;

second sound signal recording means disposed within the case, for recording the second sound signal available from the second sound reproducing means on the VHS-system tape when the second video signals are recorded on the VHS-system tape;

first control signal reproducing means disposed within the case, for reproducing first control signals recorded on the VHS-system tape;

second control signal reproducing means disposed within the case, for reproducing second control signals recorded on the beta-system tape;

third control signal producing means disposed within the case, for producing third control signals in association with the first drive means;

fourth control signal producing means disposed within the case, for producing fourth control signals in association with the second drive means;

drive control means disposed within the case, for selectively producing first drive control signals by the first control signals available from the first control signal reproducing means and the third control signals available from the third control signal producing means and second drive control signals by the second control signals available from the second control signal reproducing means and the fourth control signals available from the fourth control signal producing means, and for selectively supplying the first and second drive control signals to the first and second drive means;

first control signal recording means disposed within the case, for recording on the beta-system tape the third control signals available from the third control signal producing means or the first control signals available from the first control signal reproducing means, when the first video signals are recorded on the beta-system tape; and second control signal recording means for recording on the VHS-system tape the fourth control signals available from the fourth control signal producing means or the second control signals available from the second control signal reproducing means, when the second video signals are recorded on the VHS-system tape;

wherein when the first video signals and the first sound signals recorded on the VHS-system tape are recorded on the beta-sytem tape;

(a) the first drive control signals from the drive control means are supplied to both of the first and second drive means;

(b) the first control signals from the first control signal reproducing means and the third control signals from the third control signal producing means are supplied to the drive control means;

(c) the first video signals from the first video signal reproducing means are supplied to the first video signal recording means;

(d) the first sound signals from the first sound signal reproducing means are supplied to the first sound signal recording means; and

(e) the third control signals from the third control signal producing means are supplied to the first control signal recording means; and

wherein when the second video signals and the second sound signals recorded on the beta-system tape are recorded on the VHS-system tape,

(a) the second drive control signals from the drive control means are supplied to both of the first and second drive means;

(b) the second control signals from the second control signal reproducing means and the fourth control signals from the fourth control signal producing means are supplied to the drive control means;

(c) the second video signals from the second video reproducing means are supplied to the second video signal recording means;

(d) the second sound signals from the second sound signal reproducing means are supplied to the second sound signal recording means; and

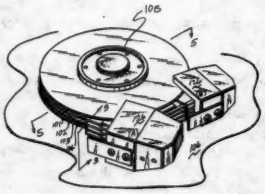
(e) the fourth control signals from the fourth control signal producing means are supplied to the second control signal recording means.

4,577,240

MULTIPLE ZONE MULTIPLE DISK VIDEO RECORDING SYSTEM

David J. Hedberg, Rancho Palos Verdes; Edward P. Denta, Jr., Buena Park, and Victor E. Jo Chiong, Torrance, all of Calif., assignors to Digital Engineering, Ltd., Torrance, Calif.

Filed Nov. 15, 1982, Ser. No. 441,790
Int. Cl.[4] H04N 5/79; G11B 5/55
U.S. Cl. 360—22 **9 Claims**



1. A video disk recording system for video signals including synchronization pulses defining fields, said signals being formed into a parallel digitized data stream comprising

a plurality M of recording disks mounted for coordinate movement,

a servo disk,

spindle means for mounting said disks for rotation in common about a single axis, said recording disks and servo disk having a plurality of data impressionable recording surfaces thereon,

said servo disk carrying a set of once-around reference pulses for establishing a position synchronizing signal to which all said data tracks are physicially and electrically synchronized,

motor means for rotating the spindle at an approximate speed for synchronizing the video pulses with the once-around reference pulses,

means forming a first plurality (A) of read/write heads and a servo reading head associated with said recording surfaces respectively,

actuator means (A) for mounting said first plurality of heads and including arm means for carrying said heads over each respective disk surface in a first zone (A),

means forming second plurality (B) of read/write heads and a servo head associated with said recording surfaces respectively,

actuator means (B) independent of said first actuator means for mounting said second plurality of heads, and including second arm means for carrying said heads over each respective recording surface in a second zone (B) independently of said first zone (A),

means for incrementally adjusting the speed of said motor means to change the phase orientation while maintaining

the disk at approximately the speed and overall lock to reference until a once-around reference pulse are received in coincidence with the incoming video sync,

means including a coincidence detector for latching the system when coincidence occurs,

means for recording alternate fields of video data on said first and second zones respectively, the actuator means of one zone performing track search functions while the actuator and heads of the other zone are reading or writing,

whereby video recording proceeds as that each video field is recorded one of a series of single cylinders defined collectively by a set of tracks on the recording disk surfaces taken together and alternating zone (B) between zone (A) and surfaces taken together.

4,577,241

DIGITAL VIDEO TAPE RECORDER APPARATUS

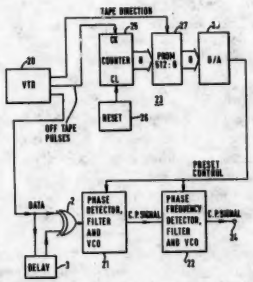
James H. Wilkinson, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,871

Claims priority, application United Kingdom, Apr. 12, 1983, 8309815

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—51 **6 Claims**



1. Digital video tape recorder apparatus comprising:

means operative in reproduction modes of the apparatus to derive a stream of coded data reproduced from a magnetic tape, a speed-dependent pulse signal of frequency dependent on the transport speed of said tape, and a direction signal indicating the direction of transport of said tape;

a first phase-locked loop circuit to which said stream of data is supplied and including a loop filter of relatively wide bandwidth and a first voltage controlled oscillator for producing a first regenerated clock pulse signal from said stream of data;

a second phase-locked loop circuit to which said first regenerated clock pulse signal is supplied and including a loop filter of relatively narrow bandwidth and a second voltage controlled oscillator for producing an output regenerated clock pulse signal from said first regenerated clock pulse signal and for use in regenerating said stream of data; and

a preset control signal generator means for deriving at least one preset control signal in dependence on said speed-dependent pulse signal and said direction signal and for supplying said at least one preset control signal to said first and second voltage controlled oscillators.

4,577,242

TAPE RECORDER HAVING A MECHANISM FOR PREVENTING ERRONEOUS SETTING TO A RECORDING MODE

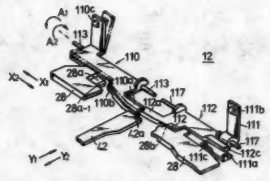
Shigeo Tetsuka, Maebashi, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jul. 24, 1984, Ser. No. 634,034

Claims priority, application Japan, Jul. 29, 1983, 58-118479

Int. Cl.⁴ G11B *15/04*

U.S. Cl. 360—60 **6 Claims**



1. A tape recorder comprising:

a tape moving direction setting mechanism for setting a tape moving mode of said tape recorder to a forward moving mode in which a tape within a loaded tape cassette moves in a forward direction or to a reverse moving mode in which the tape moves in a reverse direction;

a recording mode setting member which has an elongated shape and is displaced by a manual operation of setting an operation mode of said tape recorder to a recording mode;

a forward tab detecting member for detecting the existence of a forward erroneous erasure preventing tab of the loaded tape cassette, said forward tab detecting member having a first stopper which assumes an operating position where said first stopper opposes a tip end of said recording mode setting member so as to restrict the displacement of said recording mode setting member when said forward tab detecting member does not detect said forward erroneous erasure preventing tab, said first stopper assuming an inoperative position where said first stopper does not interfere with the displacement of said recording mode setting member when said forward tab detecting member detects said forward erroneous erasure preventing tab;

a reverse tab detecting member for detecting the existence of a reverse erroneous erasure preventing tab of the loaded tape cassette, said reverse tab detecting member having a second stopper which assumes an operating position where said second stopper opposes the tip end of said recording mode setting member so as to restrict the displacement of said recording mode setting member when said reverse tab detecting member does not detect said reverse erroneous erasure preventing tab, said second stopper assuming an inoperative position where said second stopper does not interfere with the displacement of said recording mode setting member when said reverse tab detecting member detects said reverse erroneous erasure preventing tab; and

an operating member which is displaced responsive to the setting operation of said tape moving direction setting mechanism,

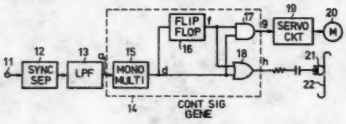
said operating member acting on said reverse tab detecting member so that said second stopper assumes the inoperative position when the tape moving mode is set to said forward moving mode, and acting on said forward tab detecting member so that said first stopper assumes the inoperative position when the tape moving mode is set to said reverse moving mode.

4,577,243

CONTROL SIGNAL GENERATING CIRCUIT FOR A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 19, 1984, Ser. No. 601,953
Claims priority, application Japan, Apr. 22, 1983, 58-71145
Int. Cl.[4] G11B *21/04, 15/473*
U.S. Cl. 360—70 7 Claims



1. A control signal generating circuit for a magnetic recording and/or reproducing apparatus, said recording and/or reproducing apparatus having supplying means for supplying a reference signal, and a control head for recording and/or reproducing a control signal on and/or from a magnetic tape, said control signal generating circuit comprising:

a monostable multivibrator for producing a pulse signal having a predetermined pulse width in response to said reference signal from said supplying means;

a flip-flop circuit responsive to the output pulse signal of said monostable multivibrator, for inverting an output thereof every time said pulse signal is supplied thereto; and

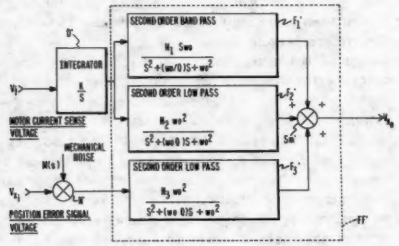
an OR gate for producing a control signal responsive to the output pulse signal of said monostable multivibrator and the output of said flip-flop circuit, and for supplying said control signal to said control head.

4,577,244

TECHNIQUES FOR DISK SERVO

Ashraf I. El-Sadi, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Division of Ser. No. 543,688, Oct. 20, 1983. This application Dec. 12, 1983, Ser. No. 560,715
Int. Cl.[4] G11B *21/10*
U.S. Cl. 360—77 16 Claims



1. A technique for providing improved head-position (error) information to a prescribed Head-positioning Servo system, this technique comprising:

deriving head-position read-back signals from a prescribed Read/Write transducer, these signals including a time-variant position-error component V_1 and a noise component V_2;

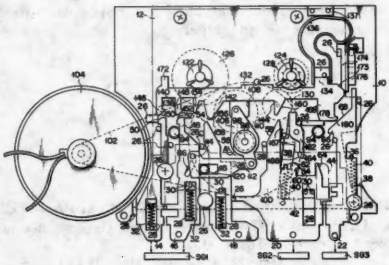
time-differentiating this signal and applying the raw signal, along with this time-differentiated version, to a "second order summing filter stage", including output-summing means.

4,577,245

OPERATING LEVER DEVICE OF MAGNETIC RECORDING TAPE TRANSPORT APPARATUS

Shigeru Nemoto; Goro Kitajima; Sinichi Saitou, and Hazime Osada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 617,825, Jun. 6, 1984, abandoned, which is a continuation of Ser. No. 382,210, May 26, 1982, abandoned. This application Feb. 21, 1985, Ser. No. 703,467
Claims priority, application Japan, May 28, 1981, 56-81723
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—93 10 Claims



1. An operating lever device for a magnetic recording tape transport apparatus which uses a tape cassette, comprising:

a first base plate;

a second base plate parallel to said first base plate with a distance therebetween;

first operating lever means disposed between said first and second base plates to be movable along the first and second base plates between a first position and a second position;

second operating lever means disposed between said first and second base plates to be movable along the first and second base plates between first and second positions and parallel to the moving direction of said first operating lever means;

an auxiliary operating lever disposed between said first and second base plates to be movable along the first and second base plates among first, second, third and fourth positions and perpendicularly to a direction of movement of said first and second operating lever means, said auxiliary operating lever in the first position thereof being spaced apart from said first and second operating lever means located in the first positions thereof in the locus of movement of said first and second operating lever means from the first position to the second position thereof, said auxiliary operating lever in the second position thereof being engaged with said first operating lever means located at the second position thereof, said auxiliary operating lever in the third position thereof being released from said first operating lever means located in the second position thereof by being spaced apart from the first position farther than from the second position in a direction from the first position to the second position thereof upon movement of said first operating lever means to the second position thereof and subsequent movement of said second operating lever means to the second position thereof, said auxiliary operating lever in the fourth position thereof being separated from the first position thereof in a dction from the second and third positions to the first position thereof upon movement of said first operating lever means to the first position thereof and subsequent movement of said second operating lever means to the second position thereof; and

ejecting means disposed at least at one of said first and second base plates for ejecting the tape cassette from the

magnetic recording tape transport apparatus upon movement of said auxiliary operating lever from the first position to the fourth position thereof.

4,577,246

CASSETTE RECORDING/REPRODUCING APPARATUS WITH AN AUTOMATIC LOADING FEED ROLLER

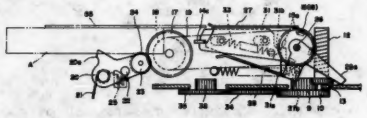
Seiichiro Matsuki, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,659

Claims priority, application Japan, Apr. 30, 1982, 57-72811; Aug. 6, 1982, 57-118824[U]

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—96.5 25 Claims



1. A cassette tape recording/reproducing apparatus of the automatic cassette loading type wherein a cassette casing inserted into a cassette inlet of the apparatus is automatically rested on reel bases, the improvement comprising

a frictional feed roller disposed adjacent the cassette inlet and adapted to be forced down by the cassette casing being inserted,

drive means for imparting a rotational force to said feed roller, and

control means responding to the forcing down of said feed roller to actuate said drive means to rotate said feed roller, thereby frictionally carrying the cassette casing into the interior of the apparatus.

4,577,247

RECORDING AND REPRODUCING APPARATUS WITH CARTRIDGE RETAINING MEANS

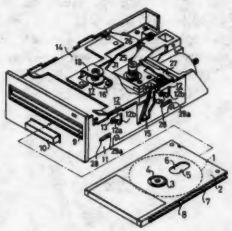
Motohiro Shimaoka, and Yukio Saito, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 22, 1983, Ser. No. 564,305

Claims priority, application Japan, Dec. 22, 1982, 57-193105[U]

Int. Cl.[4] G11B *5/12*

U.S. Cl. 360—97 7 Claims



1. A recording and reproducing apparatus comprising:

a cartridge holder adapted to accomodate a disk cartridge inserted therein, said cartridge holder being movable in said apparatus between unloaded and loaded positions;

a resilient member for normally biasing said cartridge holder toward the unloaded position from which the disk cartridge is dischargeable from the apparatus, said cartridge holder being movable to the loaded position against the biasing force of said resilient member; and

holder means mounted to said cartridge holder for pressing the disk cartridge against a portion of said cartridge holder to thereby prevent the disk cartridge from popping out when said cartridge holder is moved from the loaded to the unloaded position by the force of said resilient member, said holder means comprising a support mounted to a portion of said cartridge holder, a shaft supported in said support, and a presser movably supported on said shaft and biased in a direction for pressing against the disk cartridge inserted in said cartridge holder.

4,577,248

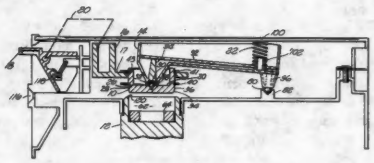
FLOPPY DISC ROTATIONAL APPARATUS

Gill Cantwell, 2434 Purdue Ave., #17, Los Angeles, Calif. 90064

Filed Jan. 31, 1983, Ser. No. 462,591

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 21 Claims



1. Apparatus for positioning and rotating a flexible disc magnetic recording medium having a centrally disposed opening with a diameter therethrough about a predetermined axis of rotation by urging said disc adjacent said opening against a rotor surface, comprising:

(A) a spindle member having at least for discrete external surfaces for engaging said disc including,

(1) a first surface defining a truncated cone having a maximum diameter less than the diameter of said opening,

(2) a second surface defining a cylinder having a diameter slightly greater than the diameter of said opening,

(3) a third surface transitioning between said first and second surfaces,

(4) a fourth surface perpendicular to and extending radially outward from said second surface, and

(5) a groove formed in said second surface for securing a ring therein, said fourth surface being a planar surface defined on said ring;

(B) bearing means centrally disposed on said axis of rotation;

(C) means for rotatably mounting said spindle member on said bearing means; and

(D) means for moving said spindle member toward and away from said rotor surface for gripping said disc between said rotor and fourth surfaces to rotate said disc.

4,577,249

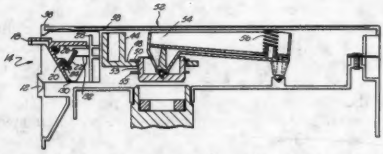
DISC LOADING APPARATUS

Gill Cantwell, 2434 Purdue Ave., #17, Los Angeles, Calif. 90064

Filed Jan. 31, 1983, Ser. No. 462,286

Int. Cl.[4] G11B *5/016, 5/55*

U.S. Cl. 360—99 28 Claims



1. Apparatus for loading and unloading a magnetic memory disc into and out of a drive mechanism having drive means therein for engaging and rotating said disc and magnetic transducers therein, said apparatus comprising:

(A) housing means having a front and rear, said front defining an opening therethrough said disc being inserted through said opening on the front of said housing means and traveling towards the rear of said housing means;

(B) lifter means pivotally supported in said housing for rotation between first and second positions, on an axis of rotation, said axis of rotation being substantially parallel with the direction of insertion of said disc within said housing, said lifter means attached to said drive means and said transducers such that when in said first position said lifter means moves said drive means and said transducers out of operative relationship with said disc and when in said second position permitting movement of said drive means and said transducers into operative relationship with said disc;

(C) separate actuating means engaging said lifter means for rotation thereof between said first and second positions; and

(D) interlock means engaging said lifter means and said housing means to preclude movement of said lifter means from said first position to said second position in the absence of a disc being inserted into said housing which thereby prevents said drive means from moving to a disc engaging position and said transducers from moving to a transducing position.

4,577,250

HALL EFFECT MAGNETIC HEAD

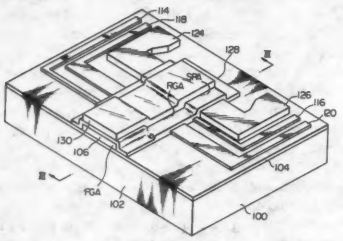
Kazuhiro Sato, Sagamihara, and Katsuhiko Oguri, Fujisawa, both of Japan, assignors to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Dec. 10, 1982, Ser. No. 448,564

Claims priority, application Japan, Dec. 18, 1981, 56-203570; Dec. 19, 1981, 56-204531; Dec. 28, 1981, 56-193285

Int. Cl.[4] G11B *5/38*

U.S. Cl. 360—112 **13 Claims**



1. A Hall effect magnetic head for performing a predetermined operation such as recording, reproducing and erasing of data on a recording medium which is capable of magnetically recording data therein, comprising:

a first magnetic member;

a second magnetic member located to face said first magnetic member;

the first and second magnetic members defining a front gap therebetween to face the recording medium;

the first and second magnetic members further defining a rear gap therebetween to the rear of said front gap, the rear gap being made up of a first rear gap portion located to the rear of the front gap at a predetermined spacing therefrom and a second rear gap portion located to the rear of said first rear gap portion at a predetermined spacing therefrom;

the first and second magnetic members further defining a space therebetween dimensioned wider than each of the front and rear gaps;

a Hall element disposed in the rear gap; and

means for developing a magnetic field within the rear gap, said means being positioned in said space.

4,577,251

MAGNETIC DISC CASSETTE HAVING DISC FLATTENING MEANS

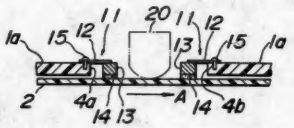
Shinichi Okada, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Mar. 8, 1983, Ser. No. 473,320

Claims priority, application Japan, Mar. 12, 1982, 57-38047; Mar. 12, 1982, 57-38048

Int. Cl.[4] G11B *25/04, 23/02*

U.S. Cl. 360—133 **9 Claims**



1. A casette for accommodating a magnetic recording medium in the form of a thin disc, said cassette being adapted for insertion in a magnetic recording/reproducing apparatus having a magnetic head, comprising:

a case having first and second substantially flat surfaces defining a cavity therebetween wherein said disc is positioned for rotation in a given direction about an axis normal to said flat surfaces, at least one of said flat surfaces having a window therein for exposing a surface of said disc to said magnetic head, said window having first and second opposite edges; and

a pressing member secured to a flat surface of said case adjacent an edge of said window and protruding into said window to resiliently press on a surface of said disc thereby flattening said surface, said pressing member including a pressing piece made of a cushioning material for contacting the surface of said disc and a resilient supporting member interposed between said case and said pressing piece for supporting said pressing piece and urging it against the surface of said disc.

4,577,252

WORD LINE NUMBER COUNT/DISPLAY DEVICE FOR TAPE RECORDER

Minoru Kobayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

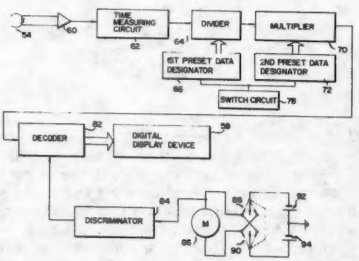
Continuation-in-part of Ser. No. 161,316, Jun. 20, 1980, Pat. No. 4,345,287. This application Jun. 21, 1982, Ser. No. 390,556

Claims priority, application Japan, Jun. 26, 1979, 54-80334

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.[4] G11B *5/008*

U.S. Cl. 360—137 **10 Claims**



1. In a tape recorder for dictation, which includes a multichannel magnetic head having a plurality of magnetic heads,

drive means for running a magnetic recording tape in a selected one of a first direction and a second direction opposite to said first direction, and first recording means connected to one of the magnetic heads in said multi-channel magnetic head, for recording a first signal including a main communication content of a dictation and a message regarding the main communication content on the magnetic recording tape when the magnetic recording tape is run in said first direction,

a word line number count/display device comprising:

second recording means connected to another one of the magnetic heads in said multi-channel magnetic head, for recording a second signal related to the length of said main communication content on the magnetic recording tape;

detecting means for detecting said second signal from the magnetic recording tape while the magnetic recording tape is running in either of said first or said second directions;

calculating means electrically connected to said detecting means for calculating the number of word lines corresponding to the main communication content on the basis of said second signal and in accordance with an average number of words spoken by a dictator during a predetermined period of time and an average number of words contained in one line of a typing paper; and

display means electrically connected to said calculating means for displaying information corresponding to the calculated number of word lines.

4,577,253

METHOD FOR LIMITING THE FAULT-GENERATED CURRENTS OF CIRCUIT BREAKERS IN A HIGH-VOLTAGE SWITCHING SYSTEM AND APPLICATION OF THE METHOD

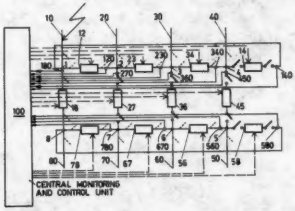
Leopold Blahous, Wettingen, and Georg Köppl, Birr, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 4, 1983, Ser. No. 491,364

Claims priority, application Switzerland, May 18, 1982, 3080/82

Int. Cl.⁴ H02B *1/24*

U.S. Cl. 361—62 **4 Claims**



1. A method for limiting the magnitude of the breaking currents of circuit breakers that are opened to isolate a short-circuited node in a high-voltage switching system, having nodes connected in the form of a ring by means of closed circuit breakers and a unit for monitoring the component short circuit currents fed to each of the nodes and for controlling the circuit breakers,

comprising as a first step, the opening of a first circuit breaker in said ring which has at least one faultless node located between each of its terminals and the short-circuited node,

and as a second step the opening of two other circuit-breakers arranged in the ring between said short-circuited node and adjacent faultless nodes.

4,577,254

PROTECTIVE RELAY SYSTEM

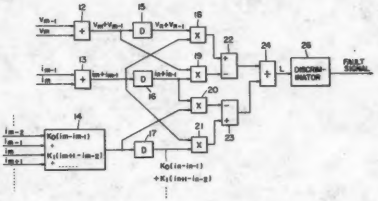
Mitsuru Yamaura, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1984, Ser. No. 637,722

Claims priority, application Japan, Aug. 10, 1983, 58-144988

Int. Cl.⁴ H02H *3/28*

U.S. Cl. 361—80 **12 Claims**



1. A machine implemented method for protecting an electric power system comprising the steps of:

providing signals indicative of instantaneous values of sampled electrical quantities or their synthetic values,

determining or discriminating the distance in accordance with the equation:

$$L_a = \frac{(i_m + i_{m-1})(v_n + v_{n-1}) - (i_n + i_{n-1})(v_m + v_{m-1})}{(i_m + i_{m-1}) \sum_{p=0}^{N} K_p (j_{n+p} - j_{n-p-1}) - (i_n + i_{n-1}) \sum_{p=0}^{N} K_p (j_{m+p} - j_{m-p-1})} \quad (21)$$

where

L represents the inductance of that portion of the electric power system which lies between the relay location and the fault point,

v_k (k=n, n−1, m, or m−1), i_k (k=n, n−1, m, or m−1), and j_k (k=n+p, n−p−1, m+p, or m−p−1) represent said instantaneous values or said synthetic values for the time point k,

n and m represent sampling time points as expressed by consecutive integers, with n and m differing from each other,

p represents integers 0, 1, . . . N,

N represents a predetermined natural number,

K_p (p=0, 1, . . . N) represents constants, with at least K_0 and K_1 being values other than zero and being so determined that the errors in the approximation for the inductance is zero for specified frequencies, and

producing a signal to be used for the protection of the electric power system according to the result of the determination or the discrimination.

4,577,255

LIGHTNING PROTECTION CIRCUIT FOR DIGITAL SUBSCRIBER LOOP INTERFACE

Philip T. Martin, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 20, 1984, Ser. No. 622,432

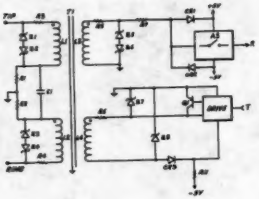
Int. Cl.⁴ H02H *9/04*

U.S. Cl. 361—119 **14 Claims**

1. A lightning protection circuit used in an interface of a digital subscriber loop having a transformer coupling communication signals from said loop to transmit and receive circuitry of said interface, comprising:

means, coupled to said loop, for absorbing energy of lightning signals coupled from said loop to said interface;

means, connected to said absorbing means, for discharging said energy, wherein said transformer has split primary windings, which are connected across said loop; and



a pair of voltage limiting means, each connected across an associated one of said split primary windings, for limiting voltage across each of said windings.

4,577,256

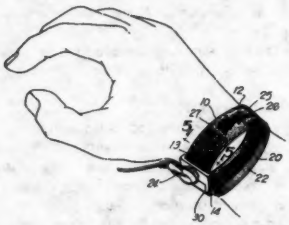
WOVEN STRETCHABLE GROUNDING STRAP

Albert C. Breidegam, Sharpsburg, Ga., assignor to Semtronics Corporation, Peachtree City, Ga.

Filed Sep. 25, 1984, Ser. No. 654,636

Int. Cl.[4] H05F *3/02*

U.S. Cl. 361—220 **17 Claims**



1. A strap for establishing electrical contact with a person's body, comprising:

(a) a length of woven material for extension in its longitudinal direction circumferentially of the person's wrist, ankle or limb, and comprising:

(i) a plurality of elastic warp yarns oriented in the longitudinal direction to allow the material to stretch; and

(ii) a plurality of electrically conductive yarns exposed on the inner surface of the material to contact the person's skin;

(b) an electrically non-conductive clasp attached to a first end of the material to capture the second end of the material for securing the strap to the person; and

(c) a fitting attached to the clasp to receive an electrically conductive cord, which fitting is in electrical contact with the conductive yarns.

4,577,257

ELECTRIC CAPACITOR WITH AN EXCESSIVE-PRESSURE SAFETY PROTECTION MECHANISM

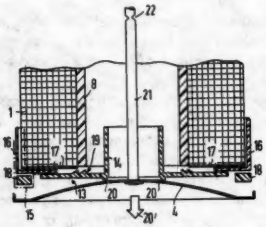
Werner Erhardt, Ballendorf, and Udo Hieber, Heidenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,808

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325343

Int. Cl.[4] H01G *1/06, 9/00*

U.S. Cl. 361—272 **3 Claims**



1. Electric capacitor comprising a housing having an inwardly-arched, substantially spherical, dome-shaped bottom membrane, a capacitor winding disposed in said housing, an exmembrane, a capacitor winding disposed in said housing, an execessive-pressure protection safety device disposed in said housing in vicinity of said bottom membrane, a central core tube disposed in said winding, and an insulating disc disposed between said winding and said bottom membrane, said insulating disc having at least two parts, said insulating disc including an extension protruding into said central core tube and said insulating disc having a surface facing said winding, said surface having corrugations formed thereon.

4,577,258

DECOUPLED INTEGRATED CIRCUIT PACKAGE

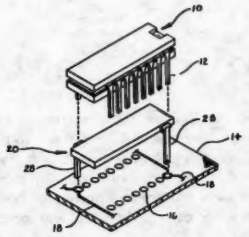
Raymond C. Jodoin, Scottsdale, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 403,408, Jul. 30, 1982, Pat. No. 4,502,101. This application Nov. 29, 1984, Ser. No. 676,490

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—321 **4 Claims**



1. A decoupling capacitor for use with an integrated circuit element which has a plurality of contact pins extending therefrom in a pair of spaced parallel rows, with a first pin in one row and a second spaced pin in the other row being power supply pins, the capacitor including:

a flat rectangular ceramic body having a pair of opposed surfaces;

a metalized coating on each of said opposed surfaces of said ceramic body;

a first conductor in electrical contact with one of said metalized coatings, and a second conductor in electrical contact with the other of said metalized coatings, said first and second conductors extending outwardly and downwardly from points located adjacent opposite sides of said body and being coordinated with the first and second spaced pins of said integrated circuit element for insertion in a pair of power supply sockets in a circuit board; and

an insulating means encapsulating said ceramic body and metalized coatings, said conductors extending through said insulating means.

4,577,259

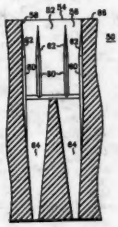
APPARATUS AND METHOD FOR RETAINING AN ELECTRONIC DEVICE

Leonard Latasiewicz, Hoffman Estates; Felix B. Melikian, Niles, and Bay E. Estes, III, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1983, Ser. No. 492,519

Int. Cl.⁴ H05K *7/02*

U.S. Cl. 361—400 **7 Claims**



1. A retaining apparatus for an electronic device comprised of a housing for completely encapsulating said device and at least one conductive lead operably connected to said device and extending from said housing, wherein said housing has a substantially uniform cross section, and further having no grooves formed therein and having no flanges formed on or attached thereto, said apparatus comprising:

a socket assembly having a first end and a second end, and including a cavity formed in said first end for receiving said housing, said cavity having a total interior periphery thereof of a greater cross sectional dimension than said housing, and at least one hole formed in said second end in communication with said cavity for receiving said lead; and

a plurality of deformable ribs extending medially from a proximal portion thereof on said interior periphery of said cavity to a distal portion thereof defining a lesser cross sectional dimension than said housing, said ribs having a beveled edge thereof adjacent an opening to said cavity

whereby said housing may be inserted into said opening and retained in position within said cavity solely by deformably engaging said ribs at said distal portion thereof.

4,577,260

VEHICLE LAMP ASSEMBLIES

Nicholas W. Tysoe, Worcester, England, assignor to Britax Vega Limited, Droitwich, England

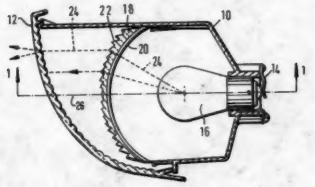
Continuation of Ser. No. 501,014, Jun. 6, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 660,252

Claims priority, application United Kingdom, Jun. 24, 1982, 8218271

Int. Cl.⁴ G03B *15/02*

U.S. Cl. 362—61 **3 Claims**

1. A vehicle lamp assembly having an optical axis and comprising a light source, a light transmitting cover element which is unsymmetrical with respect said optical axis, a light transmitting intermediate element disposed between the source and the cover element and comprising generally cylindrical inner and outer surfaces having their axes coincident with each other, perpendicular to said optical axis and located with the light source at the intersection of said optical axis and said coincident axes, one of said cylindrical surfaces carrying elongate



Fresnel prism formations of uniform cross-section extending in respective planes parallel to said coincident axes and the other cylindrical surface carrying elongate Fresnel prism formations of constant cross-section extending in respective planes perpendicular to said coincident axes, so as to direct collimated light from the source parallel to said optical axis and on to substantially the whole of the cover element.

4,577,261

LAMP MOUNTING STRUCTURE FOR BICYCLE

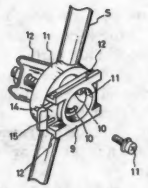
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan

Filed Aug. 29, 1984, Ser. No. 645,902

Claims priority, application Japan, Aug. 31, 1983, 58-135034

Int. Cl.⁴ B62J *6/00*; F21V *33/00*

U.S. Cl. 362—72 **6 Claims**



1. A lamp mounting structure for a bicycle, comprising:

a mounting unit including two members to firmly hold therebetween a part of a bicycle, such as a seat stay thereof;

a lamp mount detachably screwed to said mounting unit, and having angle adjusting means for adjusting the angular position of said lamp mount relative to said mounting unit;

said angle adjusting means comprising a plurality of openings provided in said lamp mount, said openings including a pair of arcuate slots centered on the same point, and in which threaded bolts are passed through said arcuate slots for screwing said lamp mount to said mounting unit; and,

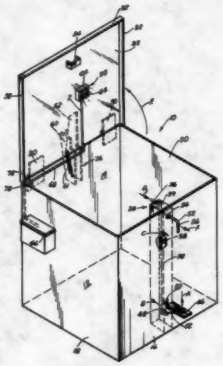
a lamp unit detachably mounted on said lamp mount, said lamp mount and said lamp unit being provided with slide coupling means for their relative sliding movement on each other, said slide coupling means comprising a pair of guide rails provided on opposite sides of said lamp mount, one rail on each side, a tongue extending from another side of said lamp mount, a latching projection provided on the tip of said tongue, and means provided in said lamp unit for engagement with said latching projection.

4,577,262

LIFE PRESERVER STORAGE CONTAINER

Leonard J. Buteaux, 114 Dock Rd., New Iberia, La. 70560

Filed Jul. 11, 1984, Ser. No. 629,920
Int. Cl.[4] F21V *33/00, 23/04*
U.S. Cl. 362—155 8 Claims



1. A storage container for life preservers, comprising:

a. a body portion having a bottom portion, a rear wall, at least two side walls and a front wall, said rear wall, front wall and side walls extending upwardly from said bottom portion, providing said body portion with an open top and defining a storage chamber interior of said walls;

b. a top portion hingedly connected along the upper edge of said rear wall for closing said opening and movable between a first opened position and a second closed position;

c. means connected to said rear wall and said top portion for normally urging said top portion to said first position, said means further comprising:

i. a lifting spring assembly rigidly attached to said rear wall; and

ii. a lifting arm attached to said top portion and in engagement with said lifting spring assembly, said lifting arm normally urging said top portion to said first position in response to pressure from said lifting spring assembly;

d. means for latching said top portion in said second position, said means further comprising:

i. a latch member positioned adjacent said front wall and movable between a first latching position and a second releasing position;

ii. a closing latch positioned on said top portion and adapted to releasably receive said latch member and retain said top portion in said second position when said latch member is in said first position;

iii. a spring in engagement with said latch member and said front wall normally urging said latch member toward said first position;

e. means operable by hand and foot for disengaging said latching means and allowing said top portion to move to said opened first position, said means comprising:

i. a foot operable actuator attached to the lower portion of said latch member and extending exterior of said body portion, said actuator causing said latch member to move to said second position and disengage from said closing latch in response to pressure upon said actuator, allowing movement of said top portion from said second position to said first position; and

ii. a hand operable actuator attached near the upper portion of said latch member and extending exterior of said body portion, said actuator causing said latch member to move to said second position in response to pressure upon said actuator in opposition to said spring.

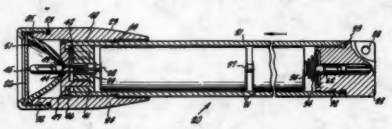
f. light means activated when said top portion moves to said first position for illumination of said storage chamber.

4,577,263

MINIATURE FLASHLIGHT

Anthony Maglica, 219 Armsluy Sq., Ontario, Calif. 91762

Filed Sep. 6, 1984, Ser. No. 648,032
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—187 4 Claims



1. A miniature flashlight comprising:

means for retaining a plurality of miniature dry cell batteries in series electrical contact;

a miniature bi-pin lamp bulb;

means for holding the miniature bi-pin lamp bulb, said means being movably retained by the means for retaining a plurality of dry cell batteries;

a substantially parabolic reflector;

a substantially planar lens;

means for retaining the reflector and the lens in a mutually fixed relationship, said means for retaining the reflector and the lens being adapted to be controllably translatable along the means for retaining a plurality of dry cell batteries such that the relative positional relationship between the reflector and the lamp bulb may be varied, thereby varying a reflection dispersion of a light beam emanating through the lens from said miniature bi-pin lamp bulb;

means for electrically coupling a first electrode of the series arranged dry cell batteries to a first pin of the bi-pin lamp bulb; and

means for electrically coupling a second pin of the bi-pin lamp bulb to a second electrode of the series arranged dry cell batteries;

wherein relative motion of the means for retaining the reflector and the lens in a direction toward the means for retaining a plurality of miniature dry cell batteries will cause the reflector to contact the means for holding the miniature bi-pin lamp bulb and further relative motion in the same direction will move the means for holding the miniature bi-pin lamp bulb to open an electrical contact at the means for electrically coupling the second pin of the bi-pin lamp bulb to the second electrode of the batteries.

4,577,264

LIGHTING APPARATUS AND SYSTEM UTILIZING MINIATURE INCANDESCENT LAMPS

George W. Plumly, Granbury, Tex., assignor to Plumly Lighting Corporation, Fort Worth, Tex.

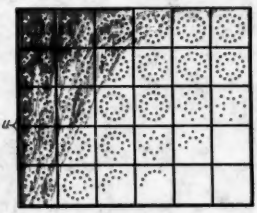
Filed Dec. 5, 1984, Ser. No. 678,669
Int. Cl.[4] F21P *1/00*
U.S. Cl. 362—252 23 Claims

1. A lighting panel comprising:

a. a plurality of groups of miniature incandescent lamps, with each said group being made up of at least four lamps, with means connecting the lamps of each group in series, with means connecting said groups in parallel, with means adapted for connecting said groups to a normal source of alternating current power, with each said lamp being rated for consumption of less than 1.5 watts when energized, with the sum of the voltage drops of the lamps of a group when operating at normal rated wattage being substantially equal to the voltage of said power source;

b. an exterior surface having the quality of specular reflec-

tion, with the filament of each said lamp being disposed outwardly of said exterior surface, with said lamps being arranged in a predetermined array with respect to said exterior surface and such that the light source density is a minimum of four lamps per square foot of said exterior surface;



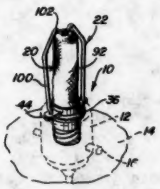
c. a lens for each said lamp, with each said lens being made of clear translucent material and forming a cavity for receiving the respective lamp, with both the lens exterior and the cavity having diffusing surfaces, and with said lens exterior diffusing surface protruding outwardly of said panel exterior surface.

4,577,265

ELECTRIC GASLIGHT SIMULATIVE

A. Frank Krause, Jr., P.O. Box 190, Fairfax, Va. 22030

Filed Nov. 15, 1984, Ser. No. 671,500
Int. Cl.[4] F21M 3/14
U.S. Cl. 362—255 **12 Claims**



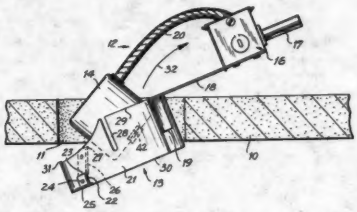
1. An electric gaslight simulative for threaded engagement with a light bulb socket in an electric light fixture comprising an adapter socket having a threaded conductive cap for threading into a light socket, said adapter socket including a body of insulative material on which the cap is mounted, a conductive light bulb socket smaller than the socket in the light fixture mounted on said body in electrical contact with the cap, a central conductive member mounted in the body and extending into the smaller socket from the opposite end of the body in insulated relation to the cap to energize a light bulb screwed into the smaller light socket, a mantle mounted on the body in enclosing relation to a light bulb in the smaller socket and a supporting wire frame connected to the body and extending alongside the mantle and supporting the outer end of the mantle to simulate a gaslight when the light bulb within the mantle is energized.

4,577,266

CEILING MOUNTED LIGHTING FIXTURE WITH THERMAL PROTECTOR

Anthony C. Donato, Westfield, and Alex Kartavenko, Clifton, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed Feb. 11, 1985, Ser. No. 700,487
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—296 **5 Claims**



1. A ceiling mounted lighting fixture adapted to be clampingly secured to a ceiling panel or the like by insertion from beneath said panel through a mounting aperture formed in said panel, said fixture comprising a generally cylindrical mounting shroud, a stand-off member secured to said shroud and projecting radially outwardly therefrom, a connector box including thermal sensor means mounted on the end of said stand-off remote from said shroud, said shroud including at the upper edge thereof a recess portion of reduced height at a position diametrically opposite said stand-off, a plurality of stop members mounted on said shroud in angularly spaced relation thereabout, said stop members including radially outwardly projecting stop flanges disposed substantially in the plane of the lowermost end of said shroud, a plurality of slots formed in said shroud, said slots extending generally in the direction of the axis of said shroud, the lowermost ends of said slots terminating in spaced relation to the lowermost end of said shroud, a plurality of spring clip members insertable into said slots, said clip members including ceiling clamp portions projecting radially outwardly of said shroud, and shroud engaging portions in frictional engagement with and shiftable axially along said slots whereby said shroud may be mounted within said ceiling by inclining said shroud from the horizontal, passing said stand-off and connector box upwardly through said mounting aperture, tilting said shroud about a turning axis normal to the axis of said stand-off to position said shroud in said mounting aperture and thereafter inserting said clip members into said slots and shifting the same downwardly to thereby clamp said ceiling between said stop flanges and clamp portions, the combination including a bulb housing, a flexible mains connector extending between said housing and said connector box, a reflector, and complemental clamp means interposed between said housing and said reflector for mounting said housing to said reflector.

4,577,267

ADAPTER FOR FIELD SIGNALS OF COMPUTERS, MICROPROCESSOR SYSTEMS OR THE LIKE DIGITAL ELECTRONIC CIRCUITS

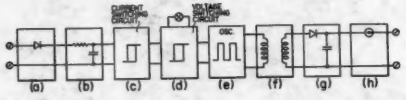
Timo Juutilainen, Espoo, Finland, assignor to Delcon Oy, Finland

Continuation-in-part of Ser. No. 341,482, Jan. 21, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 596,922
Claims priority, application Finland, Jan. 26, 1981, 810207
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—19 **10 Claims**

1. Apparatus for adapting field signals of computers, microprocessor systems or the like digital electronic circuits having output signals, including input means and output means, first switching circuit means responsive to a first level of signals at said input means, oscillator means actuated by said first switch-

ing circuit means, and transformer means having primary and secondary winding means, said primary winding means being included in said oscillator means and said secondary winding means being included in said output means, the imrovement comprising:

(a) second switching circuit means responsive to a second level of said signals at said input means, said second switching circuit means being normally operative;



(b) each of said first and said second switching circuit means exhibiting hysteresis in its response to said signals at said input means;

(c) said first switching circuit means being inoperative when said second switching circuit means is operative, and said first switching circuit means being operative when said second switching circuit means is inoperative; and

(d) said signals at said input means running through said second switching circuit means when said first switching circuit means is inoperative.

4,577,268

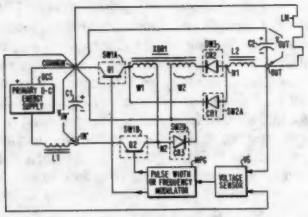
SWITCHING DC-TO-DC CONVERTERS

Finis C. Easter, Canoga Park, and Ramon H. Aires, Granada Hills, both of Calif., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 451,430, Dec. 20, 1982, Pat. No. 4,504,896, which is a continuation of Ser. No. 245,104, Mar. 18, 1981, abandoned. This application Sep. 20, 1984, Ser. No. 652,485

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **6 Claims**



1. A switching dc-to-dc converter comprising:

first and second terminals for receiving therebetween the primary dc energy to be converted;

a flyback transformer having first and second windings, which first and second windings have respective first and second ends, with currents of opposite polarities tending to flow from their first ends responsive to waxing or waning of the strength of the electromagnetic field surrounding them, the first end of said second winding being connected to said first terminal;

means recurrently applying an input current during a first series of time intervals to the first winding of said flyback transformer, to cause the waxing of the strength of an electromagnetic field for storing energy to be released by the waning of the strength of said electromagnetic field during a second series of time intervals interleaved with said first series of time intervals, which means includes

means for selectively connecting during each time interval in said first series the first end of said first winding to said second terminal, and includes

means for selectively connecting during each time interval in said first series the second end of said first winding to said first terminal;

a third terminal;

a capacitor connected between said first and third terminals;

means for recovering flyback current flow from the second winding of said flyback transformer during said second series of time intervals and combining it with transformed input current flow from said second winding during said first series of time intervals to provide an output current flow through said third terminal that continues to flow during both said first and second series of time intervals, which means includes

a dc-conductive impedance element having a first end connected to said third terminal and having a second end,

means for selectively connecting during said first series of time intervals the second end of said d-c conductive element and the second end of said second winding,

means for selectively connecting during each time interval in said second series the second end of said dc-conductive impedance element and a point on said first winding remote from its first end by the same number of turns as in said second winding, and

means for selectively connecting during each time interval in said second series said first terminal and the first end of said first winding.

4,577,269

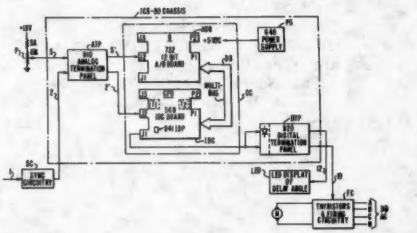
APPARATUS FOR EFFICIENT USE OF A MICROPROCESSOR TO CONTROL THYRISTORS

Alberto Abbondanti, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 20, 1982, Ser. No. 435,440

Int. Cl.[4] H02M *1/084*

U.S. Cl. 363—129 **4 Claims**



1. Thyristor gating apparatus for a microprocessor-based control system involving N thyristors connected to an AC power supply and to be fired sequentially; the apparatus including a ramp-intersect comparator having a ramp generator to provide a running count representing electrical angles therefrom on said AC power supply, said comparator being responsive (1) to a reference signal characterizing the instant of firing a thyristor "next" to be fired and (2) to said running count, to determine such firing instant; and means for firing said "next" thyristor upon said firing instant, characterized in that said ramp-intersect comparator includes:

an auxiliary counter;

a master counter serving as said ramp generator;

said microprocessor being responsive to said running count from said master counter and to said reference signal for deriving an error count;

said error count being derived by said microprocessor upon a selected instant;

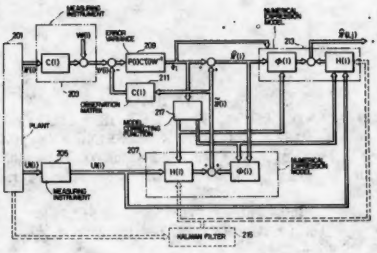
and said microprocessor presetting said auxiliary counter with said error count instantaneously after the derivation thereof upon said selected instant; said auxiliary counter being immediately thereafter triggered by said microprocessor to count down from such preset error count;

said firing means being controlled for firing upon zero count by said auxiliary counter.

4,577,270
PLANT CONTROL METHOD

Akira Sugano; Masaru Muramatsu; Sachio Yamanobe, and Yoshio Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of Japan

Continuation of Ser. No. 280,206, Jul. 6, 1981, abandoned. This application Oct. 5, 1984, Ser. No. 658,412
Claims priority, application Japan, Jul. 4, 1980, 55-90591
Int. Cl.[4] G06F *15/46;* G05B *13/04*
U.S. Cl. 364—151 **19 Claims**



1. A method of controlling and optimizing the operation of a process within a plant having at least one manipulated variable and at least one controlled variable dependent on said at least one manipulated variable, said method comprising the steps of;

measuring the present value of said at least one controlled variable;

calculating a present presumed value of said at least one controlled variable by using a first plant model formed by a mathematical procedure which uses said measured controlled variable and system noise included within said plant as data therefor;

evaluating an error corresponding to the difference between the measured value of said at least one controlled variable and said present presumed value thereof on the basis of noise included within said measured value and system noise included within said plant;

calculating a future predictive value of said at least one controlled variable by using a second plant model formed by a mathematical procedure which uses said present presumed value, said evaluated error and system noise included within said plant as data therefor;

correcting said first plant model in such a manner that said evaluated error becomes zero; and

adjusting said at least one manipulated variable in accordance with said future predictive value and a desired value of said at least one controlled variable.

4,577,271
SAMPLED DATA SERVO CONTROL SYSTEM

Donald H. Jones, Pittsburgh, and Spencer W. Allen, Murrysville, both of Pa., assignors to International Cybernetics Corporation, Pittsburgh, Pa.

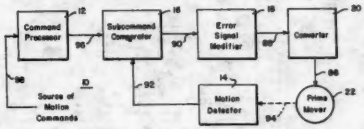
Filed Aug. 15, 1983, Ser. No. 523,061
Int. Cl.[4] G06F *15/46;* G05B *13/02*
U.S. Cl. 364—174 **21 Claims**

1. A sampled data system for controlling the motion of an object comprising:

means for processing a command representative of the desired motion of the object by generating at least one series of subcommands, each subcommand representing a segment of the desired motion over a time period;

means for comparing said subcommands to at least one signal representative of the actual motion of the object and generating at least one error signal representative of the variation of a characteristic of the actual motion of the object from the corresponding characteristic of the motion represented by said subcommands;

means for detecting a single motion characteristic of the



actual motion of the object and generating all said actual motion signals therefrom;

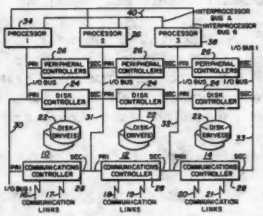
means for so modifying said error signal that said system exhibits a set of desired performance characteristics; and

means for converting at least one said modified error signal to a signal suitable for application to a prime mover which causes said object to exhibit said desired motion.

4,577,272
FAULT TOLERANT AND LOAD SHARING PROCESSING SYSTEM

James D. Ballew, Garland, and Phil H. Rogers, Dallas, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jun. 27, 1983, Ser. No. 508,101
Int. Cl.[4] G06F *15/16, 11/00*
U.S. Cl. 364—200 **19 Claims**



1. A method of allocating incoming messages for processing in one channel of a multi-channel fault tolerant, load sharing data processing system and for reassigning message upon the malfunctioning of a channel, comprising the steps of:

identifying each incoming message at each channel of the data processing system containing data to be processed for assignment to one of the channels of the systems for processing;

assigning the identified message to the channel having the smallest number of messages waiting to be processed;

transmitting the identified message to the assigned channel for processing in the order assigned;

transmitting the assigned message to at least one other channel of the system for back-up storage;

monitoring each of the channels of the system for a malfunction condition;

identifying each message in all functioning channels that remains unprocessed and assigned to the malfunctioning channel;

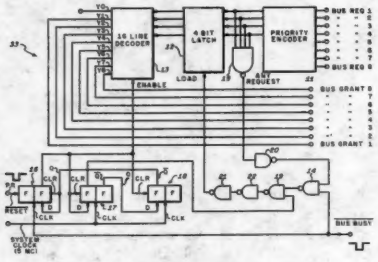
reassigning each of the identified messages to the remaining functioning channels on the basis of the smallest number of messages waiting to be processed; and

in response to a reassignment of a message, processing the message in the reassigned channel.

4,577,273
MULTIPLE MICROCOMPUTER SYSTEM FOR DIGITAL COMPUTERS

Michael G. Hopper, Burke, Va., and Harri G. Prival, Potomac, Md., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,304
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 1 Claim



1. A multiple microcomputer system comprising:

a plurality of microcomputer means coupled to provide data, address, control and identification signals to an intercommunication bus, and coupled to provide a bus request signal to a priority resolution means for executing programs and for signalling and acknowledging high speed interchange of data among said plurality of microcomputer means;

priority resolution means coupled to provide bus grant signal to said plurality of microcomputer means for determining which microcomputer means among said plurality of microcomputer means shall have access to said intercommunication bus; said priority resolution circuit includes:

a priority encoder coupled to receive a plurality of bus request signals and coupled to provide an encoded signal to a four bit latch and a first NAND gate;

a sixteen line decoder coupled to receive an output from said four bit latch and coupled to provide a plurality of said bus grant signals;

a first inverter coupled to receive an output from said first NAND gate;

a second NAND gate coupled to receive an output from said first inverter and also coupled to receive a bus busy signal;

a third NAND gate coupled to receive an output from said second NAND gate and also coupled to receive an input from a second flip-flop;

a second inverter coupled to receive an input from said third NAND gate;

a third inverter coupled to receive an input from said second inverter and coupled to provide an output to said four bit latch;

a first flip-flop coupled to receive a system clock input, a reset input, and a D input from a third flip-flop and coupled to provide an output to said sixteen line decoder;

said second flip-flop coupled to receive a system clock input and a D input from said first flip-flop;

said third flip-flop coupled to receive a D input from said second flip-flop, and coupled to receive a system clock input and coupled to receive an output from said first flip-flop;

plurality of memory means in said plurality of microcomputer means for storage of programs, data, address, and control signals; each of said plurality of memory means having signalling block of memory wherein an address to said signalling block initiates an interrupt signal for specifying a service routine to be followed in regard to processing transferred data;

said plurality of memory means each partitioned into blocks wherein each said block is dedicated to a specified microcomputer means;

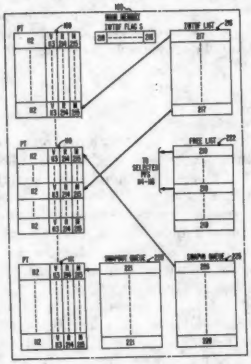
coded signals comprising a first predetermined plurality of bits for identifying a selected microcomputer to receive inter-microcomputer communications and a second predetermined plurality of bits for identifying a selected memory location in said selected microcomputer memory means, and

coded signal identification circuit contained in each said microcomputer means responsive to said coded signals for recognizing which inter-microcomputer communications are destined for selected microcomputer means.

4,577,274
DEMAND PAGING SCHEME FOR A MULTI-ATB SHARED MEMORY PROCESSING SYSTEM

Gary S. Ho, San Jose, Calif., and Ralph W. Peterson, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1983, Ser. No. 512,379
Int. Cl.[4] G06F *12/12, 12/10, 12/06, 13/00*
U.S. Cl. 364—200 36 Claims



35. In a processing system using paged virtual storage addressing and including an addressable main store having a plurality of page frames for storing selected pages of information, and a plurality of flushable address translation stores for storing the main store addresses corresponding to selected virtual storage addresses, a paging apparatus comprising:

initializable flush-indicating means, cooperative with the address translation stores, for indicating whether the plurality of address translation stores have been flushed since initialization of the flush-indicating means;

reference-indicating means, cooperative with the flush-indicating means, for indicating whether a selected at least one page frame has been referenced since initialization of the flush-indicating means;

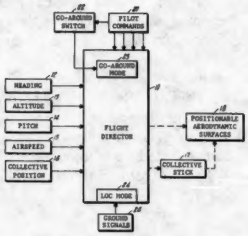
means, cooperative with the flush-indicating means and with the reference-indicating means, for selecting from the at least one page frame a page frame indicated not to have been referenced, after the plurality of address translation stores are indicated to have been flushed; and

means, cooperative with the selecting means, for storing a page in the page frame selected by the selecting means.

4,577,275
FLIGHT DIRECTOR GO-AROUND MODE

Don L. Adams, Fairfield; Charles W. Evans, Norfolk, and Stuart C. Wright, Woodbridge, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1983, Ser. No. 499,682
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—433 4 Claims



1. A flight director having a channel for controlling the lift (climb/descent) of an aircraft in response to a collective command and having a channel for controlling the airspeed of the aircraft in response to a pitch command, comprising:

a switch for providing a go-around signal in response to a pilot input;

altitude means for providing a rate signal indicative of the aircraft vertical rate;

airspeed means for providing an airspeed signal indicative of the aircraft airspeed; and

signal processing means connected for response to the switch, the altitude means and the airspeed means, for providing the collective command in response to the go-around signal to cause the aircraft to climb at a predetermined rate as indicated by the rate signal, for providing the pitch command to increase the airspeed of the aircraft in response to the go-around signal when the airspeed signal is indicative of an airspeed that is less than a predetermined airspeed, such as the maximum rate of climb airspeed of the aircraft, and for providing the pitch command to decrease the airspeed in response to the go-around signal only when the airspeed signal is indicative of an airspeed that is greater than the predetermined airspeed and if the predetermined rate of climb is not achieved within a predetermined time interval after go-around was commanded by the pilot.

4,577,276
PLACEMENT OF COMPONENTS ON CIRCUIT SUBSTRATES

Alfred E. Dunlop, New Providence, and Brian W. Kernighan, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 12, 1983, Ser. No. 531,423
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—491 9 Claims

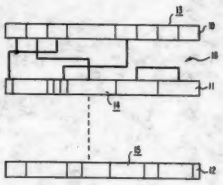
1. An integrated circuit fabricated in accordance with a design procedure comprising the steps of

(a) determining a plurality of modules of integrated circuit components from which said integrated circuit can be fabricated,

(b) successively partitioning said plurality of modules into successively smaller subsets of modules maximally connected within subsets and minimally connected between subsets in accordance with a known partitioning algorithm,

(c) successively dividing the area of a substrate into subareas proportional to the areas of the polycells in said subsets,

(d) placing said modules on said substrate in accordance with the subarea location to which said modules are assigned, and

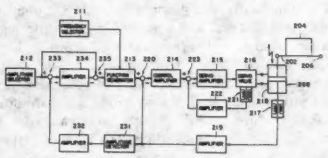


(e) propagating connections to terminal external to each of said subareas to the periphery of the respective subareas prior to said partitioning step.

4,577,277
METHOD AND APPARATUS OF CONTINUOUS CASTING BY THE USE OF MOLD OSCILLATING SYSTEM

Futoshi Kamei; Shinichi Harada, both of Kobe; Akira Yasunishi, Hyogo; Minoru Takemura, Kobe; Takeshi Fujikawa, Hyogo; Shinzo Iida, and Yasuyuki Katayama, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 24, 1983, Ser. No. 525,896
Claims priority, application Japan, Mar. 7, 1983, 58-37169; Jul. 22, 1983, 58-134962
Int. Cl.[4] B22D *11/04*
U.S. Cl. 364—472 5 Claims



5. A continuous casting apparatus with a mold oscillating system adapted to put a casting mold in oscillation at a preselected amplitude and frequency, said oscillation system comprising:

an oscillating frame substantially of U-shape in plan view and having a pivoting shaft and an oscillator, free ends of opposite side frame portions thereof being pivotally supported on such pivoting shaft and oscillated up and down by said oscillator wherein said oscillator is connected to a center portion of a transverse frame portion thereof;

an oscillation control circuit connected to said oscillator to control oscillator of said mold;

wherein said oscillator further comprises an electrohydraulic servo having a cylinder, said cylinder being connected to said oscillating frame and driven according to a signal of preselected amplitude and frequency produced by said control circuit;

wherein said control circuit further comprises:

a function generator for generating a control signal of preselected amplitude and frequency and for inputting said control signal to said electrohydraulic servo;

an amplitude detector for converting a position signal of said cylinder to an amplitude signal;

a deviation detector for calculating an amount of deviation of said amplitude signal from said preselected amplitude;

a multiplier for multiplying said amount of deviation by a coefficient to produce a first result; and

an adder for adding said first result to said preselected ampli-

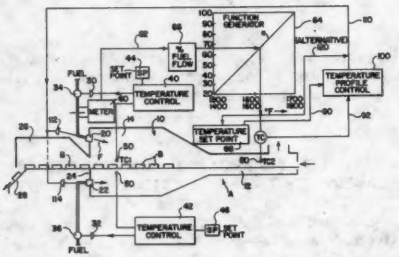
tude to produce a second result and for inputting said second result to said function generator.

4,577,278

METHOD AND SYSTEM FOR CONTROLLING A SELECTED ZONE IN A FUEL FIRED FURNACE

Robert A. Shannon, Avon Lake, Ohio, assignor to North American Manufacturing Company, Cleveland, Ohio

Filed Jul. 18, 1983, Ser. No. 514,921
Int. Cl.[4] F27D 3/00
U.S. Cl. 364—477 26 Claims



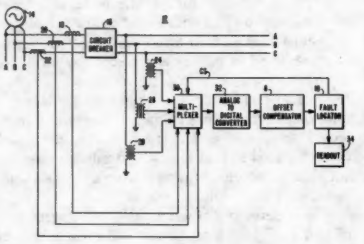
1. A method of heating a selected zone in a fuel fired furnace having means for moving work through said selected zone in a given direction from an entrant end to and through an exit end of said zone at a variable production rate, said furnace further having a means for controlling the heating rate in said zone and means for controlling the temperature profile in said zone and in a direction parallel to said given direction between a first short profile with the point of maximum energy liberation adjacent said exit end and a second long profile with said point of maximum energy liberation spaced from said exit end, said method comprising: controlling said heating rate in accordance with the exit temperature of said selected zone and adjacent to said exit end of said zone, establishing a desired set point temperature at said entrant end of said zone corresponding to said heating rate as controlled by said exit temperature, and inversely adJusting said temperature profile in response to deviation of the actual temperature at the entrant end of said zone from said set point temperature until said heating rate and temperature profile reach an equilibrium condition.

4,577,279

METHOD AND APPARATUS FOR PROVIDING OFFSET COMPENSATION

Seymour Salowe, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1983, Ser. No. 499,624
Int. Cl.[4] H02H 3/18
U.S. Cl. 364—483 4 Claims



1. A fault locating device adapted for use in a power system network to determine a fault location on a faulted power line within a few cycles after fault occurrence from measured signals representative of the voltage and current of the faulted power line, said measured signals including a transient decaying exponential offset component initiated by said line fault, said fault locating device including:

means coupled to a power line in said power system network for measuring the voltage and current thereof and for generating signals representative of said measured voltage and current;

means for sampling the amplitudes of at least one said voltage and current signals at a sampling rate which renders M+1 amplitude samples per cycle of the power line frequency;

offset compensating means for removing substantially said transient decaying exponential offset component from said at least one of said voltage and current signals by operating on the sampled amplitudes of said one signal X to generate compensated amplitude samples therefrom in accordance with the following relationship:

$$Y_{N-P} = X_{N-P} - \left(\frac{1}{M+1}\right) \sum_{\alpha=0}^{M} X_{N-\alpha},$$

where X_N denotes an instant amplitude sample taken by said sampling means, X_{N-1} through X_M denote the previous M consecutive sample amplitudes, whereby the M+1 amplitude samples form a set of samples which set moves in time with each taking of a new instant amplitude sample by said sampling means, where X_{N-P} denotes an amplitude sample within each sample set P samples from said instant amplitude sample X_N, and where Y_{N-P} denotes a corresponding compensated amplitude sample for each sample set; and

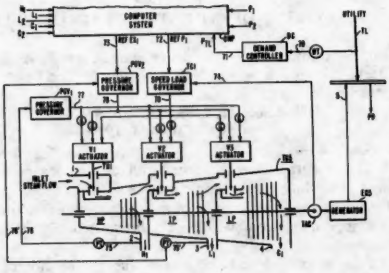
fault locator for determining the fault location on the faulted power line from the compensated amplitude samples generated by said offset compensating means, whereby the determination of the fault location may be performed within a few cycles of the fault occurrence without being hampered by the transient offset component.

4,577,280

CONTROL SYSTEM FOR FLUID FLOW DISTRIBUTION

Richard E. Putman, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1983, Ser. No. 548,478
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—494 21 Claims



1. In a system for the distribution of fluid through a plurality of input fluid lines to satisfy a demand of fluid through a plurality of output lines, with at least one common header collecting fluid from at least two parallel such output lines, the combination of:

control means for selectively changing the flow between

said input lines and for concurrently and selectively changing the flow between said output lines in accordance with a predetermined optimization criterion;

decoupling means responsive to an intended change to be done by said control means according to said optimization criterion as effected upon one of said parallel output lines for anticipating changes through the system as effected by said control means upon the others of said parallel output lines; and

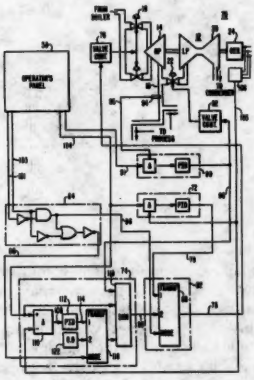
said control means combining each of such intended changes and of correlative said anticipating changes for simultaneously changing the flow between said input and output lines in accordance with said intended and anticipating changes, thereby to compensate for a discrepancy in said optimization criterion due to said correlative anticipating changes.

4,577,281

METHOD AND APPARATUS FOR CONTROLLING THE CONTROL VALVE SETPOINT MODE SELECTION FOR AN EXTRACTION STEAM TURBINE

James M. Bukowski; Gary E. Midock, both of Pittsburgh, and Ronald J. Walko, Bethel, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1983, Ser. No. 562,378
Int. Cl.[4] F01D *17/02*
U.S. Cl. 364—494 **15 Claims**



1. A control apparatus for operating an extraction steam turbine-electric power generation system to satisfy extraction steam and megawatt output demand, said apparatus comprising:

at least one turbine inlet steam control valve;

a turbine extraction valve;

a first valve controller means for positioning said control valve;

a second valve controller means for positioning said extraction valve;

a megawatt output transducer means for generating a megawatt feedback signal corresponding to the existing level of megawatt output;

a sensor means for generating an extraction feedback signal corresponding to the existing level of extraction steam;

a control mode selector means for determining a first operational state corresponding to the presence of said megawatt output demand and the absence of said extraction steam demand and a second operational state corresponding to the presence of both said megawatt output demand and said extraction steam demand;

an operator panel means for generating at least one signal to determine the operation of said control mode selector means in accordance with an operator selection at said operator panel means;

a control valve setpoint signal selection controller means for selecting a first control valve setpoint signal in said first operational state or a second control valve setpoint signal in said second operational state and establishing said selected control valve setpoint signal operative with said first valve controller means;

a control valve setpoint signal controller means for determining said first control valve setpoint signal in accordance with said megawatt output demand and said megawatt feedback signal, said first control valve setpoint signal connected to said control valve setpoint signal selection controller means;

an extraction valve setpoint signal controller means for determining an extraction valve setpoint signal in accordance with said extraction steam demand and said extraction feedback signal, said extraction valve setpoint signal operative with said second valve controller means; and

a control valve setpoint signal correction controller means for determining said second control valve setpoint signal in accordance with a predetermined function of said megawatt feedback signal, said megawatt output demand, and said extraction valve setpoint signal, said second control valve setpoint signal connected to said control valve setpoint signal selection controller means.

4,577,282

MICROCOMPUTER SYSTEM FOR DIGITAL SIGNAL PROCESSING

Edward R. Caudel, and Surendar S. Magar, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,852
Int. Cl.[4] G06F *9/00, 13/00*
U.S. Cl. 364—200 **8 Claims**

1. A microcomputer device for digital signal processing formed in a single semiconductor unit comprising:

an arithmetic/logic unit having data input and data output;

an accumulator having an input connected to said data output and an accumulator output;

a data memory having an address input and having data input/output means;

data bus means coupled to the data input of the arithmetic/logic unit and to said accumulator output and coupled to the data input/output means of the data memory;

means connecting the accumulator output to a data input of the arithmetic/logic unit separately from the data bus means;

data input/output terminals for coupling to circuits external to the semiconductor unit, and means connecting the data bus means to said data input/output terminals;

a shifter in the coupling from the data bus means to a data input of the arithmetic/logic unit, and means in said shifter for shifting a selectable number of bits;

a program memory having an address input and having an instruction output, the program memory storing instruction words;

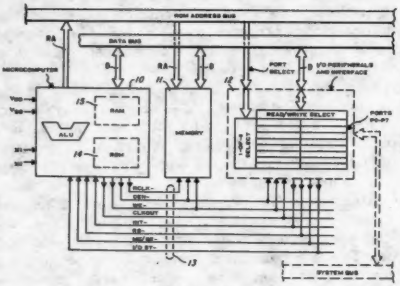
program address means connected to the address input of the program memory means;

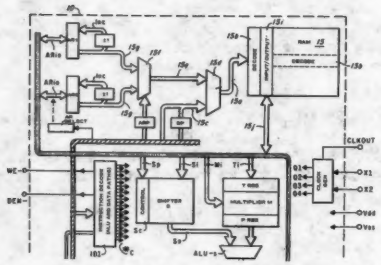
control means for generating controls in response to instruction words received from said program memory means or from said data input/output terminals, the controls defining operation of the arithmetic/logic unit and transfer to and from the bus means;

program bus means separate from said data bus means coupled to said instruction output, to an input of said control means, to said program address means, and to said input-/output terminals, for transfer of instruction words and program memory addresses;

and timing means for establishing overlapping operating cycles during one of which data may be transferred from the data memory to a data input of the arithmetic/logic

unit via said shifter, and the arithmetic/logic unit produces results to the accumulator for one instruction, the control means receives an instruction word from the





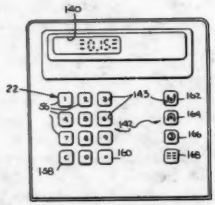
instruction output via said program bus means for the next instruction, and the program address means applies an address to the address input of the program memory for another following instruction.

4,577,283

POSTAGE METER WITH KEYBOARD KEYS FOR CAUSING METER OPERATIONS TO BE PERFORMED

John H. Soderberg, Stratford; Howell A. Jones, Southport; Alton B. Eckert, Norwalk, and Edward E. Duwel, Trumbull, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,861
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—464 **25 Claims**



1. In a postage meter having means for entering data, means for displaying numerical values and other data, means for printing postage, computer means electrically connected to each of the aforesaid means and programmed for processing data for controlling the operation thereof, wherein said data entering means includes a keyboard having a plurality of depressable numeric keys, and wherein said computer means includes means for storing data and calculating amounts pertaining to the operation of said postage meter, an improvement in the operation of said postage meter, the improvement comprising:

(a) said keyboard including a depressable special purpose key;

(b) said computer means programmed for causing said displaying means to display a numerical value in response to the depression of selected numeric keys;

(c) said computer means programmed for automatically processing said numerical value on display in response to the depression of said special purpose key; and

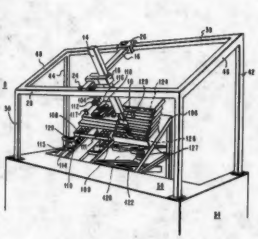
(d) said computer means programmed for causing a particular operation of said postage meter to be performed in response to the depression of said special purpose key when said displayed numerical value is a predetermined value corresponding to said particular operation.

4,577,284

ADAPTIVE ROBOT BATCH ASSEMBLY SYSTEM

Arthur E. Christy, and Elmer J. Gill, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 363,994, Mar. 31, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,447
Int. Cl.[4] G06F *15/46, 15/20*
U.S. Cl. 364—513 **7 Claims**



1. An adaptive assembly system comprising:

a computer controlled robotic manipulator for performing a plurality of assembly task sequences; and

a plurality of task oriented workstations, each workstation containing all parts and tooling for supporting and supplying a given assembly task, each task oriented workstation being selectively positionable in locking engagement with framework supporting the manipulator

whereby the manipulator may advance from one workstation to another with no down time associated therewith.

4,577,285

GAGE BLOCK MANAGEMENT SYSTEM

Donald H. Bailey, Bloomfield Hills, Mich., assignor to Suburban Tool, Inc., Birmingham, Mich.

Continuation-in-part of Ser. No. 427,859, Sep. 29, 1982, Pat. No. 4,542,473. This application May 25, 1983, Ser. No. 497,808
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—560 **14 Claims**

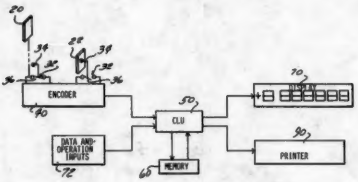
1. A gage block management system comprising:

a case for removably receiving a plurality of gage blocks, each having opposed gage surfaces with a nominal dimension therebetween and a known deviation from the nominal dimension;

means for specifying a pre-determined stack height formed of selected ones of the gage blocks;

memory means for storing the nominal dimension and known deviation of each gage block and a control program for selecting which gage blocks are to be selected to form the specified stack height;

control means for executing the control program in the memory means and selecting which gage blocks are to be selected to form the specified stack height; and



means, responsive to the control means, for indicating which gage blocks are to be removed from the case to form the specified stack height.

4,577,286

SOLAR ENERGY-POWERED CALCULATOR OR THE LIKE

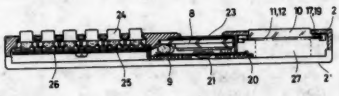
Yutaka Yoshimura, and Masahiro Hikami, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jan. 4, 1984, Ser. No. 568,073

Claims priority, application Japan, Jan. 8, 1983, 58-875[U]; Feb. 1, 1983, 58-15840

Int. Cl.⁴ G06F *1/00*; H01L *31/04*

U.S. Cl. 364—708 **3 Claims**



1. An electronic calculator containing a plurality of solar cells powering the internally provided electronic parts comprising;

a removable integrated unit comprising said solar cells, a protective filter, and support means for securing said solar cells to the filter;

a plurality of terminals present in said appliance for obtaining the power generated by said solar cells; and

means for achieving electrical connections either between said solar cells or between said solar cells and said electronic parts upon installing said integrated unit into said electronic appliance.

4,577,287

METHOD AND APPARATUS FOR GENERATING DIGITAL SIGNALS REPRESENTING PERIODIC SAMPLES OF A SINE WAVE

Christopher J. Chrin, Lisle, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 2, 1983, Ser. No. 471,330

Int. Cl.⁴ G06F *15/31*

U.S. Cl. 364—721 **13 Claims**

1. A method of generating electrical digital signals representing periodic sample values for a sine wave, the period of sample generation being T seconds, the frequency of said sine wave being F, T being less than 1/2F, comprising the steps of:

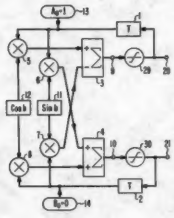
(a) generating electrical signals representing initial values of c and d, $c=\sin 2\pi FT$, $d=\cos 2\pi FT$, rounded up in absolute value such that $c^2+d^2 \geq 1$;

(b) generating electrical signals representing an initial value, e, of said sine wave, and f, the value of cosine corresponding to e;

(c) generating a preliminary next value, S', of said sine wave by calculating $cf+de=S'$, and generating a cosine value, C', corresponding to S', by calculating $df-ce=C'$;

(d) generating a final next value S of said sine wave and C of the corresponding cosine value, respectively, by limiting to one any magnitude of S' and C' respectively, which exceeds one;

(e) setting $e=S$, $f=C$;



(f) transmitting an electrical signal representing the value of S to a user of said signal; and

(g) repeating steps c, d, e and f every T seconds for the duration of the time of generation of said digital sine wave.

4,577,288

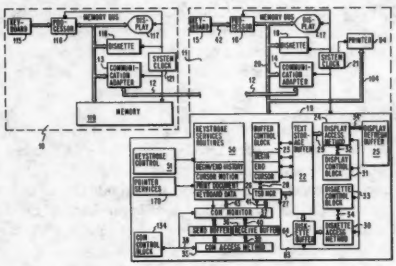
DATA COMMUNICATIONS SYSTEM WITH RECEIVING TERMINAL FOR VARYING THE PORTIONS OF RECEIVED DATA BEING DISPLAYED

Dennis G. Busch, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,050

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—900 **4 Claims**



1. In a data communication system comprising at least one data transmitting display terminal and at least one data receiving display termianl wherein said data receiving display terminal also functions to transmit data and said data transmitting terminal also functions to receive data, the improvement wherein each said data receiving and transmitting display terminal comprises;

means operative during data transmission for storing data received from said at least one data transmitting terminal;

means operation during said data transmission for concurrenty displaying the alphanumeric representation of said received stored data, the screen capacity of the data receiving display terminal being less than that required to display all of said received stored data at a time;

cursor means operative during data transmission for concurrently and selectively designating entire portions of said displayed received data for printing, said cursor means comprising display and control means;

means for concurrently printing said designated portions during said data transmission.

4,577,289

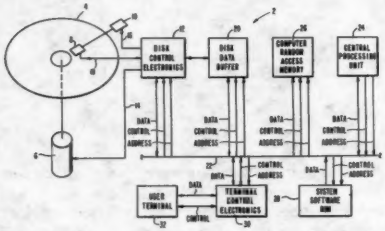
HARDWARE KEY-ON-DISK SYSTEM FOR COPY-PROTECTING MAGNETIC STORAGE MEDIA

Liam D. Comerford, Carmel, and Steve R. White, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,294

Int. Cl.[4] G06F *12/14*

U.S. Cl. 364—900 **63 Claims**



1. A method of determining by a computer if a particular magnetic medium comprised of sections which are divided into subsections is an original or a copy, with an original having indicia on at least one subsection of at least one section thereon that are not modifiable by the medium write process, and a copy not having said indicia, or having indicia in a different pattern than said indicia, including a product program which is to be executed only if the medium is an original, and a medium test program for performing said method to test if said particular medium is an original, said method comprising the steps of:

writing at least portions of said sections of said particular medium with a test pattern which generates a change in the pattern of magnetic domains in said medium at predetermined locations within said portions, said portions including at least said indicia-containing subsections, with a subsection in said portions responding to said test pattern only in the absence of indicia thereon, to form a stored pattern in said portions;

storing an expected pattern, which is indicative of the pattern which is expected to be read from said portions of an original medium including said indicia;

comparing said expected pattern with said stored pattern on at least a per subsection basis, to determine if predetermined subsections have the expected pattern of magnetic domains; and

executing said product program only in response to the comparison determining that the corresponding subsections have the expected pattern of magnetic domains, which is indicative of the presence of said indicia, thereby indicating that said particular medium is an original.

4,577,290

REPLICATOR WITH IMPROVED PROPAGATION PERFORMANCE

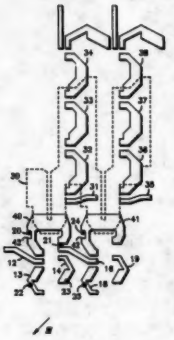
David C. Markham, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 26, 1984, Ser. No. 593,469

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—12 **7 Claims**

1. A magnetic bubble domain memory replicator for replicating magnetic bubble domains and having a first magnetic pole end, a second magnetic pole end, a replicating area, and a notch located in the replicator adjacent to the second magnetic pole end for momentarily storing a magnetic bubble domain as



the domain moves from the replicating area to the second magnetic pole end.

4,577,291

THERMO-OPTICAL DATA WRITING PROCESS AND DATA MEDIUM FOR PERFORMING THIS PROCESS

Jean Cornet, Paris, France, assignor to Thomson-CSF, Paris, France

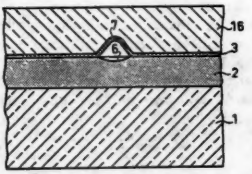
Continuation of Ser. No. 517,748, Jul. 27, 1983, abandoned, which is a continuation of Ser. No. 226,803, Jan. 21, 1981, Pat. No. 4,404,656. This application Aug. 27, 1984, Ser. No. 644,648

Claims priority, application France, Jan. 23, 1980, 80 01423

The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.

Int. Cl.[4] G11C *11/46*

U.S. Cl. 365—126 **18 Claims**



1. A thermo-optical data writing process using a focused radiation beam intensity modulated to write in data in the form of topographic features protruding from portions of the recordable surface of a recording medium at which the impact of said beam produces a sharply focused illumination, said process comprising the steps of:

forming said recording medium of a layer of organic material undergoing thermal degradation above a predetermined temperature threshold with production of gas, said layer being flanked on one side with a thermal triggering layer of a ductile material wherein said topographic features are permanently recorded as a result of local evolution of said gas and loss of adhesion between said layers causing plastic stretching of said ductile metal below its elongation at break, said recording surface corresponding to said thermal triggering layer, said organic material layer being further flanked on its other side with supporting means not liable to substantially reflect radiation impinging from said thermal triggering layer;

using an intermediate metal layer for firmly affixing said

thermal triggering layer to said layer of organic material; and

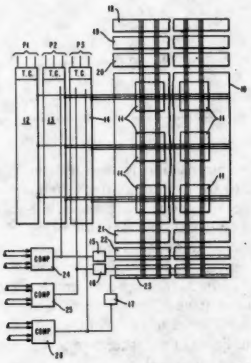
causing said beam to strike said thermal triggering layer to selectively trigger said thermal degradation from a heating consisting in the direct conversion of an amount of radiant energy from said focused radiation beam to produce, once optically absorbed, enough localized surface heating of said organic material layer to raise the temperature above said threshold thereby providing said topographic features in accordance with said thermal degradation.

4,577,292

SUPPORT CIRCUITRY FOR MULTI-PORT SYSTEMS

Kerry Bernstein, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1983, Ser. No. 499,729
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—189 **6 Claims**



1. In a memory array having cells each of which is separately addressable from a plurality of write lines and is readable by a plurality of sets of low to high order bit lines, comprising:

a memory cell array,

a set of low to high order word decoders coupled to each cell of the array,

a set of low to high order read heads coupled to each cell of the array, the lowest order read head being coupled to the cell via the lowest order bit lines and the higher read heads being respectively coupled to the cell, via respective higher order bit lines, said read heads being equal in number to the number of said word decoders,

at least one inhibit and transfer circuit coupled to each of said higher order read heads,

address comparison means coupled to said higher order word decoders and said higher order read heads,

each of said inhibit and transfer circuit comprising a pair of bit activated transistors having their control electrodes respectively coupled to the low order bit lines,

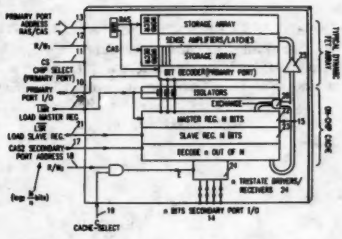
a pair of grounding transistors each being coupled between a respective high order bit line and ground, and switching transistors coupled in parallel with the bit line activated transistors and respectively coupled to the control electrode of the grounding transistors to selectively control one of the grounding transistors and transfer the state of a lower order bit line to a higher order bit line.

4,577,293

DISTRIBUTED, ON-CHIP CACHE

Richard E. Matick, Peekskill, and Daniel T. Ling, Croton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,046
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—189 **9 Claims**



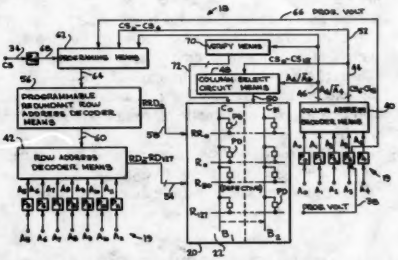
1. A distributed, on-chip cache comprising a secondary row port buffer on a plurality of dynamic random access memory chips, each of said memory chips comprising a primary port for access to a storage array on the chip, said secondary row port buffer, and isolation means for providing a normally isolated connection between said secondary row port buffer and said storage array, said secondary row port buffer comprising a master register, a slave register, and parallel input-/output driver means for providing access to said slave register, said master register being loaded from said storage array through said isolation means and subsequently when said secondary row port buffer is isolated from said storage array by said isolation means, said slave register being loaded from said master register.

4,577,294

REDUNDANT MEMORY CIRCUIT AND METHOD OF PROGRAMMING AND VERIFYING THE CIRCUIT

George W. Brown, and Phi Thai, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 18, 1983, Ser. No. 485,695
Int. Cl.⁴ G11C *11/40, 7/00*
U.S. Cl. 365—200 **37 Claims**



1. Apparatus for accessing information, comprising:

(a) a memory for storing the information, said memory having a matrix of a plurality of rows and a plurality of columns and having a redundant row;

(b) row address decoder means add column address decoder means for receiving and decoding, respectively, row and column addresses to access said plurality of rows and said plurality of columns to store the information in said memory and to deselect a defective row of said plurality of rows by accessing said memory to disconnect said defec-

tive row from all of said plurality of columns, said defective row having a row address;

(c) programmable decoder means, coupled to said redundant row, for receiving and decoding any one of the row addresses to select said redundant row; and

(d) means, coupled to said column address decoder means, for programming said programmable decoder means to decode said row address of said defective row.

4,577,295

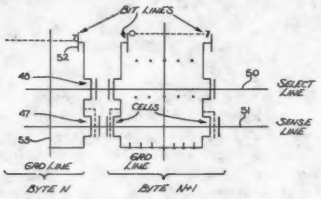
HYBRID E^2 CELL AND RELATED ARRAY

Boaz Eitan, Sunnyvale; Avi Kolodny, Cupertino; Daniel Amrany, Sunnyvale, and James McCreary, Los Gatos, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 31, 1983, Ser. No. 499,198

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—218 **12 Claims**



1. An MOS integrated circuit, electrically programmable and electrically erasable memory cell arrangement formed on a substrate comprising:

a memory cell including;

(i) a pair of spaced-apart regions disposed in said substrate;

(ii) a floating gate disposed at least between said spaced-apart regions, said floating gate being insulated from said substrate by a first insulative layer and a portion of said floating gate being insulated from said substrate by a second insulative layer through which charge is tunnelled from said floating gate to said substrate, said second insulative layer being thinner than said first insulative layer;

(iii) a control gate disposed at least between said spaced-apart regions, said control gate being disposed above and insulated from said floating gate;

injection means for injecting charge into said substrate during the programming of said cell; and

electrical means coupled to said spaced-apart regions, control gate and injection means for programming said cell such that said injected charge is transferred from said substrate through said first insulative layer onto said floating gate and for erasing said cell such that charge from said floating gate is tunnelled through said second insulative layer into said substrate,

whereby the area of said substrate required for said cell may be reduced since the capacitive coupling between said floating gate and said control gate may be reduced.

4,577,296

COMPENSATION CURRENT GENERATOR

Thomas S. W. Wong, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

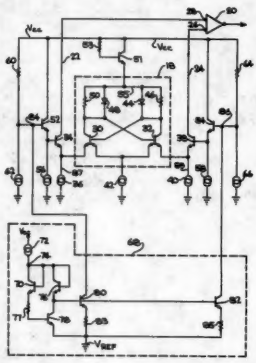
Filed Mar. 1, 1984, Ser. No. 585,332

Int. Cl.[4] G11C *7/04*; G05F *1/58*

U.S. Cl. 365—226 **8 Claims**

1. A circuit including a reference current source and at least one transistor contained therein, said circuit providing a current at an output terminal, which current is inversely proportional to the current gain of said at least one transistor, and is directly proportional to said reference current source, and is directly proportional to a scaling factor n, said circuit further including,

a diode-connected compensation transistor having a collector terminal, a base terminal, and first and second emitter terminals, said collector terminal being coupled to said reference current source, said base terminal being coupled to said collector terminal of said diode-connected compensation transistor, said first emitter terminal being coupled through a first resistance element to a base terminal of said at least one transistor, and said second emitter terminal being coupled to a collector terminal of said at least one transistor, and



a second compensation transistor having a base terminal coupled to the second emitter terminal of said diode-connected compensation transistor, said base terminal of said second compensation transistor being further coupled to the collector terminal of said at least one transistor, said second compensation transistor also having an emitter terminal coupled through a second resistance element to a reference voltage terminal, and a collector terminal coupled to said output terminal of said circuit, said at least one transistor having an emitter terminal coupled to said reference voltage terminal.

4,577,297

METHOD FOR ENHANCING RECORDED MARINE SEISMIC REFLECTION SIGNALS HAVING UNDULATING WATER BOTTOM DISTORTIONS

Cynthia T. Kalkomey, Irving; Thomas J. Mason, Dallas, and Keh Pann, Richardson, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 372,273, Apr. 27, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 753,818

Int. Cl.[4] G01V *1/38, 1/00*

U.S. Cl. 367—24 **1 Claim**

1. In a seismic record section of marine seismic reflection signals from subsurface interfaces recorded at an exploration site having a water layer overlying an undulating water bottom and having the seismic shot points and receiver points located above the undulating water bottom, the method of enhancing the seismic record section by the removal of the distortion on the recorded seismic reflection signals caused by the undulating water bottom comprising the steps of:

(a) gathering together all common shot point seismic reflection signals,

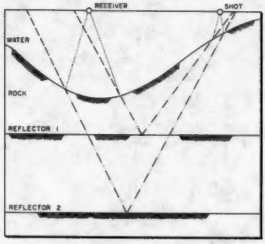
(b) decreasing the length of the upgoing reflection signal in all said common shot point seismic reflection signals, so as to simulate receiver points immediately below said undulating water bottom, thereby removing the velocity effect of the water layer from the recorded seismic reflection

signals in all said common shot point seismic reflection signals,

(c) increasing the length of the upgoing reflection signal in all said common shot point seismic reflection signals so as to simulate receiver points along a new horizontal datum above said undulating water bottom, thereby replacing the removed water layer velocity effect in all said common shot point seismic reflection signals with the velocity effect of the earth medium below the water bottom,

(d) gathering together all common receiver point seismic reflection signals,

(e) decreasing the length of the upgoing reflection signal in all said common receiver point seismic reflection signals so as to simulate shot points immediately below said undulating water bottom, thereby removing the velocity effect of the water layer from the recorded seismic reflection signals in all said common receiver point seismic reflection signals,



(f) increasing the length of the upgoing reflection signal in all said common receiver point seismic reflection signals so as to simulate receiver points along a new horizontal datum above said undulating water bottom, thereby replacing the removed water layer velocity effect in all said common receiver point seismic reflection signals with the velocity effect of the earth medium below the water bottom, and

(g) recording said velocity replaced seismic reflection signals to produce a seismic record section on which the undulating water bottom distortion has been removed.

4,577,298

METHOD FOR CORRECTING SURFACE CONSISTENT STATICS IN SEISMIC TRACES

David Hinkley, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,321

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 367—50 **2 Claims**

1. A method for determining surface consistent statics associated with recorded seismic trace signals comprising the steps of:

(a) generating acoustic waves into a geological formation from a plurality of acoustic wave sources;

(b) recording arriving representations of acoustic waves generated from said sources at a plurality of spaced receiver locations;

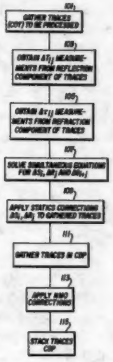
(c) forming a common offset trace (COT) gather of recorded acoustic waves;

(d) measuring the differences in arrival times of reflection signal components in said COT gathered traces;

(e) normalizing the paths taken by the refraction signal components to the paths taken by the reflection signal components to correct for slant paths (angular displacements) between said refractions and reflection signal components;

(f) measuring the differences in arrival times of the normalized refraction signal components in said COT gathered traces;

(g) determining said source and receiver statics for said COT gathered traces; and



(h) aligning said gathered traces in time by shifting each said COT gathered trace by an amount corresponding to a determined source and receiver static associated therewith; and

(i) determining the two way travel time from a datum to a reflection boundary.

4,577,299

ACOUSTIC DIRECTION FINDER

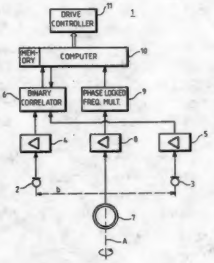
Hans P. Blaschke, Steinhöring; Winfried Knappik, Planegg; Horst Mette, Oberndorf, and Peter Scholler, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,201

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220175

Int. Cl.⁴ G01S *3/80*

U.S. Cl. 367—120 **8 Claims**



1. An acoustic correlation direction finding device comprising:

a rotating base having a plurality of sound pickups spaced thereon, each sound pickup operable to generate a base signal responsive to sound from a sound source;

a rotational position sensor connected to said base for generating a rotation signal having a frequency equal to a rotation frequency of said base;

multiplier means connected to said rotation position sensor for processing said rotation signal in a phase-locked loop manner to produce clock pulses;

computer means connected to said multiplier means and controlled by said clock pulses, each two clock pulses defining an angle sector of rotation of said base;

and a digital correlator means connected to each of said pickups for receiving and correlating the pickup signals and connected to said computer means, said computer means controlling said correlator at a timing set by said clock pulses for generating correlation functions of the pickup signals for each angle sector, and adds together all the correlation functions of each sector for plural rotations of said base, said correlation functions being weighted with a time factor corresponding to a decay time by said computer means, said computer means functional to smooth the curve of the correlation peaks of the correlation functions associated with each angle sector in succeeding angle sectors and operable to determine a direction of the sound source.

4,577,300

DISC PLAYERS FOR REPRODUCING AN INFORMATION SIGNAL FROM A ROTATING DISC

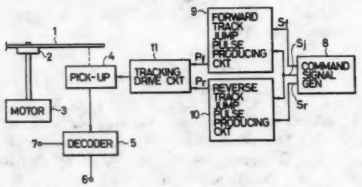
Akira Katsuyama, Yokohama, and Shuichi Kimura, Shiki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,928

Claims priority, application Japan, Jul. 12, 1982, 57-105519[U]

Int. Cl.⁴ G11B *21/10*

U.S. Cl. 369—43 **4 Claims**



1. A disc player for reproducing from a rotating disc an information signal recorded thereon in a plurality of record tracks defined by successive turns of a spiral signal path, said disc player being selectively operable in one of a normal reproducing mode, a fast-forwarding mode and a fast-reversing mode, said disc player comprising:

pick-up means for determining a reading position on said disc;

control means for controlling said pick-up means to move said reading position radially in respect to the center of rotation of said disc, said control means moving said reading position gradually in said normal reproducing mode in a forward radial direction of said disc so as to accurately trace said spiral signal path as said disc rotates to reproduce said information signal recorded therein; and

track jump circuit means operative in said fast-forwarding mode and in said fast-reversing mode to initiate a track jump operation in said forward radial direction and in a reverse radial direction, respectively, at regular first intervals, and regular second intervals, respectively;

said control means being responsive to each said initiation of a track jump operation in said fast-forwarding and said fast-reversing modes, respectively, to cause said pick-up means to jump said reading position from one turn to another turn during a first minor portion of the respective interval and to move said reading position gradually in said forward radial direction so as to trace substantially along said other turn for the remaining major portion of said respective interval;

said first interval in said fast-forwarding mode being longer than said second interval in said fast-reversing mode, whereby the number of said jump operations occurring in a predetermined time in said fast-reversing mode is greater than the number of said jump operations occurring in said predetermined time in said fast-forwarding mode.

4,577,301

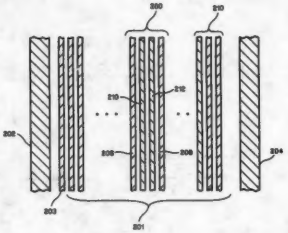
TRACK PITCH CALIBRATION ERROR REDUCTION

Harlan P. Mathews, and Craig Cambier, both of Boulder County, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,686

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **16 Claims**



6. A track pitch calibration system for use in an optical storage system to insure that radiation beams directed to a surface of a record carrier used with said storage system are properly aligned with data tracks written on said record carrier, said storage system including means for following a previously written track with a first radiation beam, and means for positioning a second radiation beam a desired distance from said first radiation beam in response to an offset signal, said track pitch calibration system comprising:

a set of at least four calibration tracks written on the record carrier having a desired track pitch or distance therebetween; and

means for optically measuring the track pitch between two of said calibration tracks and for generating said offset signal in response to said measurement.

4,577,302

APPARATUS FOR REPRODUCING MOTION PICTURE FILM PHOTOGRAPHIC SOUND-TRACKS TO CORRECT REPRODUCTION ERRORS AND REDUCE NOISE

Ioan R. Allen, Tiburon, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed Mar. 14, 1983, Ser. No. 475,026

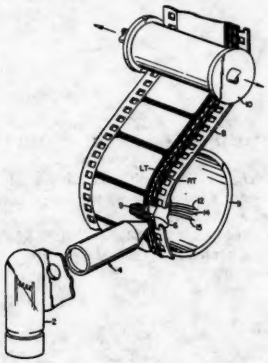
Int. Cl.⁴ G11B *7/20*

U.S. Cl. 369—46 **22 Claims**

1. Apparatus for reproducing motion picture film variable area photographic sound-tracks, wherein the film has at least one bilateral format sound-track in which substantially identical audio information is recorded in mirror-image halves of said at least one bilateral sound-track, comprising

means for reading said at least one bilateral sound-track to generate a first and a second signal, the first signal being generated substantially in response to one half of the bilateral sound-track and the second signal being gener-

ated substantially in response to the other half of the bilateral sound-track; and



means for comparing the two signals to provide non-audio information for correcting reproduction errors and reducing noise.

4,577,303

TEST EQUIPMENT FOR PHONO PICKUP NEEDLES

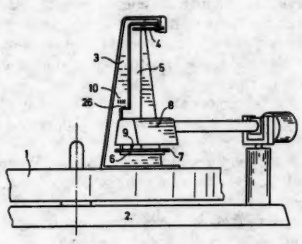
Heinrich Zimmermann, Joh.-Seb.-Bach-Str. 14, D-7742 St. Georgen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,799

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322230

Int. Cl.[4] G11B *3/00*; H04N *5/76*

U.S. Cl. 369—55 **18 Claims**



1. Test equipment for reproducing styli for records to determine the amount of wear of the scanning tip of a stylus, which equipment employs components of a record player, comprising

a turntable capable of being turned manually;

a reproducing stylus to be tested used for a scanning of records;

a pickup supporting the reproducing stylus;

a base part to be positioned on the turntable;

an axis disposed at the base part;

a carrying part supported by the base part and rotatable about the axis such that the carrying part is movable about in a plane parallel to the base part on the turntable;

a test support area made of a material corresponding to a record, which test support area is provided with grooves and which test support area rests on the carrying part such that the grooves correspond in their positon to the grooves of a record and where the stylus engages a groove;

elastic coupling means between the carrying part and the base part, where the restoring force of the coupling means increases with increasing relative turning of the base part with respect to the carrying part; and

display means indicating the relative turning of the base part with respect to the carrying part.

4,577,304

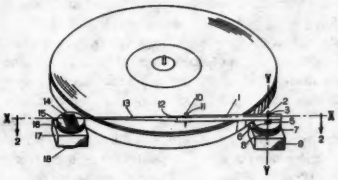
DEVICE FOR CORRECTING AUDIO RECORD'S GROOVE ECCENTRICITY

Hamid Hannani, 327 S. 46th St., Philadelphia, Pa. 19143

Filed Jul. 5, 1983, Ser. No. 510,749

Int. Cl.[4] G01B *7/00*; G11B *25/04*

U.S. Cl. 369—56 **8 Claims**



1. A method of positioning a record on a turntable in a concentric manner independent of a center contact between said record and said turntable's spindle shaft, comprising the steps of:

enlarging the center hole of said record so that the contact between said record and said turntable's spindle shaft is avoided;

rotating said record on said turntable and tracing a groove of said record by a groove tracking means;

enlarging the horizontal displacement of said groove tracking means so that said horizontal displacement can be visually detected in relation to a stationary monitoring device;

bringing said turntable to a stop at a maximum horizontal displacement of said groove tracking means;

repositioning said record in accordance with said concentric information so as to attain a concentric position of said record.

4,577,305

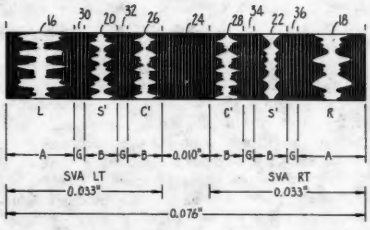
STEREOPHONIC MOTION PICTURE PHOTOGRAPHIC SOUND-TRACKS COMPATIBLE WITH DIFFERENT SOUND PROJECTION FORMATS AND RECORD AND PLAYBACK APPARATUS THEREFORE

Ioan R. Allen, Tiburon, and Craig C. Todd, Muir Beach, both of Calif., assignors to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed Mar. 14, 1983, Ser. No. 475,036

Int. Cl.[4] G11B *7/20*; H04R *5/00*

U.S. Cl. 369—86 **21 Claims**



1. A motion picture film having a photographic sound-track for selective reproduction of monophonic sound when used with conventional moonophonic photographic sound projec-

tion apparatus, for reproduction of stereophonic sound when used with conventional stereo variable area (SVA) photographic sound projection apparatus, said SVA sound projection apparatus used conventionally for reproducing a conventional LT SVA track are and a conventional RT SVA track area on motion picture films, for reproduction of four-channel sound when used with 2-4 matrix decoding stereo variable area photographic sound projection apparatus, and for reproduction of discrete four-channel sound when used with appropriate discrete four-channel sound projection apparatus; said sound-track comprising four or six variable area tracks occupying substantially the conventional LT and RT SVA track areas reproduced by conventional stereo variable area sound projection apparatus, said tracks having modulation levels and widths and carrying four channel sound with levels, amplitude and phase relationships such that when the tracks are summed when used with conventional monophonic projection apparatus substantially compatible monophonic sound is reproduced, when the tracks are summed using conventional stereo variable area (SVA) projection apparatus, substantially compatible stereophonic channels are reproduced for use as two-channel sound, for 2-4 matrix decoding into four-channel sound, and when the tracks are separately read by appropriate discrete four-channel sound projection apparatus, discrete four-channel sound is reproduced.

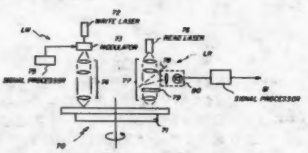
4,577,306
METHOD FOR OPTICALLY WRITING AND/OR READING INFORMATION ON OPTICAL RECORDING ELEMENTS

Dennis G. Howe, Fairport, and Joseph J. Wrobel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 408,399, Aug. 16, 1982, abandoned, which is a division of Ser. No. 124,381, Feb. 25, 1980, Pat. No. 4,360,908. This application Apr. 2, 1985, Ser. No. 719,622

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—109 **6 Claims**



1. A method for optically writing and reading information on an optical recording element, said method comprising the steps of:

(a) providing an optical recording element having a recording stratum of predetermined nominal thickness overlying a reflective support, said stratum being highly absorptive of light of a first wavelength and heat-deformable by such light to form recorded pits of decreased stratum thickness, said stratum being highly transparent with respect to light of a second wavelength and having optical properties such that a stratum from said nominal thickness to said decreased stratum thickness will produce a substantially greater phase shift in reflected light of said second wavelength than will a stratum thickness increase from said nominal thickness of equal magnitude;

(b) writing information on said recording element by scanning said stratum with an intensity-modulated beam of light of said first wavelength, such beam of light being effective to selectively decrease the thickness of said stratum according to information to be written;

(c) scanning the written-upon stratum with a beam of light of said second wavelength to produce reflected light having an instantaneous phase determined by the thickness of the scanned portion of said stratum; and

(d) sensing the instantaneous phase of said reflected light.

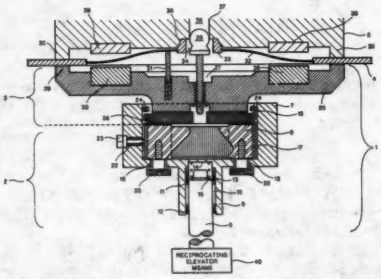
4,577,307
OPTICAL DISK MAGNETIC LOAD/UNLOAD MECHANISM

John W. Woods; Paul Kummli, and Edward M. White, all of Boulder County, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Sep. 27, 1984, Ser. No. 655,847

Int. Cl.[4] G11B 9/06, 19/20

U.S. Cl. 369—270 **6 Claims**



1. An apparatus for selectively clamping an optical information recording disk to a spindle in an optical information recording device, said apparatus comprised of:

a reciprocating elevator means;

a non-rotating disk support assembly, said non-rotating disk support assembly being attached to the reciprocating elevator means;

a rotating disk support assembly, said rotating disk support assembly supporting the disk to be clamped to the device spindle;

magnetic clamping means for selectively clamping support assembly to the non-rotating disk support assembly comprising:

an electromagnet, said electromagnet being disposed in the non-rotating disk support assembly,

a magnetically permeable shunt plate, said shunt plate being attached to a bottom surface of the rotating disk support assembly and having a taper around a lower rim thereof,

means for selectively energizing the electromagnet during disk load and unload operations, but de-energizing the electromagnet when the disk is clamped to the device spindle for device rotation, and

a shunt plate centering ring, said ring being attached around the electromagnet and having a tapered upper end which cooperates with the lower taper around the magnetic shunt plate to cause the magnetic shunt plate, and thereby the rotating disk support assembly, to be properly positioned and centered over the electromagnet;

means for centering the rotating disk support assembly on the device spindle;

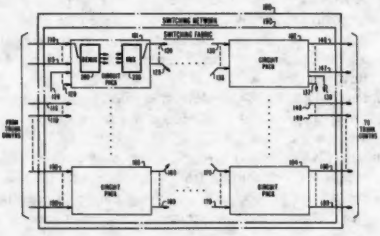
means for centering the disk on the device spindle; and

means for selectively clamping the rotating disk support assembly, and in turn the disk, to the device spindle for spindle rotation.

4,577,308
MULTIPLEXED INTERCONNECTION OF PACKET SWITCHING NODE PACKAGES

Mikiel L. Larson, St. Charles, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 6, 1984, Ser. No. 597,508
Int. Cl.[4] H04J *15/00, 11/04*
U.S. Cl. 370—9 **16 Claims**



1. A switching network comprising at least one arrangement of switching nodes and a plurality of signal transmission links connected to the at least one arrangement, each arrangement comprising:

a plurality of signal switching nodes, each node having at least one signal input, and a plurality of signal outputs;

at least one demultiplexer each having an input port connected to a link for receiving a multiplexed stream of signals and having a plurality of output ports each coupled to an input of a node for transmitting to each coupled node input a substream of signals demultiplexed from the received stream; and

at least one multiplexer each having a plurality of input ports each coupled to an output of a node for receiving from each coupled node output a signal substream, and having an output port connected to a link for transmitting a signal stream multiplexed from the plurality of received substreams; wherein

each signal substream comprises a plurality of serial signals each representing the value of a bit; and wherein

each multiplexed signal stream comprises a plurality of pulse-width modulated signals each representing the value of a plurlaity of bits.

4,577,309
METHOD AND APPARATUS FOR MEASURING DISTANT ECHO DELAY IN AN ECHO CANCELLING ARRANGEMENT

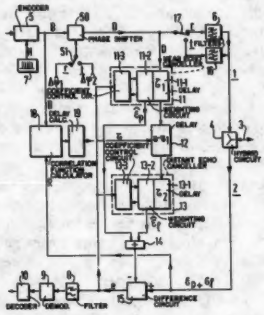
Bahman Barazeche, Paris; Roger P. J. Alexis, Neuilly sur Seine, and Loïc B. Y. Guidoux, Garancieres, all of France, assignors to 501 Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Dec. 19, 1983, Ser. No. 562,612
Claims priority, application France, Dec. 30, 1982, 82 22124
Int. Cl.[4] H04J *15/00;* **H04B** *3/20*
U.S. Cl. 370—32 **11 Claims**

1. A method of measuring delay of a distant echo signal, for use in adapting an echo cancelling circuit incorporated in a transceiver to cancel an echo signal occurring in the receive path of the transceiver in response to a signal transmitted in the transmit path thereof; such echo signal consisting of a substantially undelayed near echo signal and a delayed distant echo signal; such echo cancelling circuit comprising a near echo canceller receiving the signal from the transmit path without delay and a distant echo canceller receiving such transmit path signal with a delay substantially equal to the measured delay of the distant echo signal; said method comprising the steps of:

transmitting, by modulation of a carrier wave, successive data sequences having a periodic autocorrelation function with sidelobes of negative or zero value and having a duration at least equal to the maximum value of the delay to be measured, the number of elements of each data sequence determining the accuracy of measurement of the distant echo delay;

after transmitting each data sequence, calculating the correlation function between the data of the next transmitted sequence and the data recovered by demodulating the received echo signal produced by the preceding data



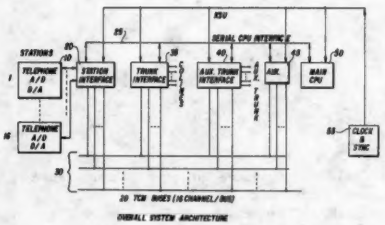
sequence and storing successive samples representative of said correlation function in a memory;

processing the stored correlation function samples to eliminate samples corresponding to the near echo signal and to determine from among the remaining samples the sample corresponding to the maximum value of said correlation function; and calculating the delay of the distant echo signal from the rank order of such maximum sample among such remaining samples.

4,577,310
STATION INTERFACE FOR DIGITAL ELECTRONIC TELEPHONE SWITCHING SYSTEM HAVING CENTRALIZED DIGITAL AUDIO PROCESSOR

Vincent V. Korsky, Shelton, and Chansak Laotetpitaks, Woodbridge, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Filed May 16, 1984, Ser. No. 610,700
Int. Cl.[4] H04J *11/04*
U.S. Cl. 370—58 **15 Claims**



1. Apparatus in a digital electronic telephone switching system for coupling a plurality of digital telephone instruments to a digital data bus having a plurality of time division multiplexed digital data channels allotted thereon, and for enabling two way communication between selected ones of said telephone instruments and said digital data bus comprising:

means coupled to said digital data bus for temporarily storing digital data transmitted on said bus, said storing means comprising a plurality of storage locations, each storage

location corresponding to a channel of said digital data bus;

first time division multiplexing means coupled to said telephone instruments for receiving a plurality of first signals from said telephone instruments and for converting said first signals into a first time-division multiplexed serial signal;

second time-division multiplexing means coupled to said telephone instruments for receiving a second serial signal having digital data for each of said telephone instruments time-division multiplexed thereon and for converting said digital data of said second serial signal into a plurality of parallel serial data streams for each of said telephone instruments;

control means including computer means coupled to said storing means for succesively selecting desired ones of said plurality of storage locations, thereby providing a serial selected digital data signal from the storing means; and

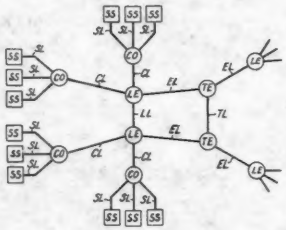
processing means coupled to said storing means, said digital data bus and said first and second time division multiplexing means for digitally processing the serial selected digital data signal from said storing means and said first serial signal so as to modify the digital representation of the amplitude of voltage levels represented by said serial selected digital data signal and said first serial signal so as to produce a modified serial selected digital data signal and a modified first serial signal, said modified serial selected digital data signal being coupled to said second time-division multiplexing means as said second serial signal and said modified first serial signal being coupled to said digital data bus.

4,577,311

PACKET-BASED TELECOMMUNICATION SYSTEM

Jean F. Duquesné , 32 rue La Fontaine, 75016 Paris, and Boris Rozenwaig, 8, rue Redouté , 92360 Meudon-La-Foret, both of France

Continuation-in-part of Ser. No. 333,983, Dec. 23, 1981, abandoned. This application Jun. 20, 1985, Ser. No. 746,635
Claims priority, application France, Dec. 24, 1980, 80 27513
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **1 Claim**



1. Multiservice packet telecommunication network of the invention comprising:

a plurality of subscriber's stations each connected to several sources of analog data signals and digital data signals and including means for digitizing said analog data signals from those of said sources which are analog data signal sources;

a plurality of means in each subscriber's station for forming, transmitting and receiving packets constituted by said digital data signals and said digitized data signals, said packets having an information field, an address field and a start word and end word fields, said start word field preceding said address field;

packet switching networks, each connected to said subscriber's stations and to other packet switching networks through incoming and outgoing data channels;

means for inserting in the address field of the packet a sequence of addresses including a first, second, . . . n^{th} addresses defining the outgoing data link of the first, second, . . . n^{th} switching networks included in the route of the packet between a packet sender station and a packet receiver station; and it is characterised in that the outgoing channel from each switching network towards other switching networks and the subscriber stations are associated in groups of a plurality of outgoing channels, the whole group having one and the same address common to all the channels of the group and the switching network further comprises

means (342A, 342B) for detecting said common address of a group in the address field of a packet conveyed in an incoming channel; and

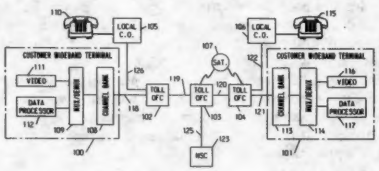
means (344A, 344B) controlled by said address detecting means for searching a free-non-addressed outgoing channel of the group, said searching means connecting said free outgoing channel to said incoming channel.

4,577,312

ARRANGEMENT FOR WIDEBAND TRANSMISSION VIA A SWITCHED NETWORK

Peter D. Nash, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 5, 1984, Ser. No. 627,898
Int. Cl.[4] H04J *3/16, 3/22*
U.S. Cl. 370—84 **8 Claims**



1. For use in a communications network having a plurality of switching offices, customer wideband terminals, and time division multiplex (TDM) channels having a relatively narrow bandwidth for interconnecting said terminals via said offices, a method for establishing to a designated one of said terminals a facility having a wider bandwidth than any one of said TDM channels comprising the steps of:

establishing to said designated terminal a selected plurality of said TDM channels whose combined bandwidth is at least equal to the bandwidth required by said designated terminal,

transmitting from one end over each said selected TDM channel a test pattern of data in successive time frames,

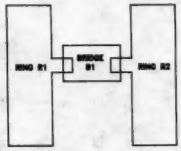
measuring the relative delay between selected TDM channels by comparing at the other end of said selected channels during a particular time frame the data received on each one of said selected TDM channels with the data received on another one of said selected TDM channels, and

selectively inserting delay in the transmission of data over any of said selected TDM channels so that data transmitted in a single time frame from one end over all said selected TDM channels will be received at the other end of all said selected TDM channels in a single time frame.

4,577,313
ROUTING MECHANISM WITH ENCAPSULATED FCS FOR A MULTI-RING LOCAL AREA NETWORK

Kian-Bon K. Sy, 432 Farmstead Dr., Cary, N.C. 27511

Filed Jun. 4, 1984, Ser. No. 616,754
Int. Cl.[4] H04J 3/00
U.S. Cl. 370—88 9 Claims



1. In a telecommunication network system wherein a plurality of serial loop networks are being interconnected by a plurality of switching stations and each serial loop having thereon one or more stations, a method for maintaining end-to-end integrity of data comprising the steps of:

(a) generating and transmitting from a source station a frame including a destination address, a source address, an RI field and a frame check sequence (FCS) pattern;

(b) receiving the frame at a switching station connected to the loop;

(c) preserving the FCS pattern;

(d) calculating and appending a new FCS pattern to the received frame;

(e) forwarding the frame;

(f) receiving the frame at a switching station not connected to the loop;

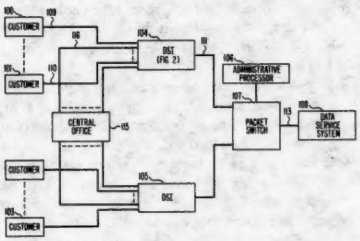
(g) calculating and appending a new FCS pattern to the received frame;

(h) repeating steps (e) through (g) until the last switching station is reached whereby the station does not calculate a new FCS pattern but uses the preserved FCS pattern as the frame CRC.

4,577,314
DIGITAL MULTI-CUSTOMER DATA INTERFACE

Jean Chu, Naperville; Mark G. Hinch, Wheaton; James M. Johnson, Jr., Glen Ellyn; Henry J. Kafka, Bolingbrook, and David J. Stelte, Wheaton, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1983, Ser. No. 481,057
Int. Cl.[4] H04J 6/00
U.S. Cl. 370—94 40 Claims



1. A digital customer interface arrangement for communicating packets of data between a plurality of customer lines and a packet switch and comprising

means responsive to a receipt of serial bit signals for a plurality of customer lines for serially time multiplexing said bit signals,

means responsive to a receipt of the time multiplexed bit signals for assembling individual byte signals for each one of said lines,

means cooperating with said assembling means and controlled by the assembled byte signals for generating individual packets of data signals for each one of said lines,

means for storing each generated packet of signals,

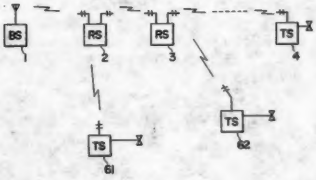
means responsive to a receipt of customer line status bit signals from said time multiplexing means for control buffering said status bit signals for each of said lines, and

means controlled with said buffered status bit signals and by said generating means for controlling a reading of the stored packets of signals from said storing means for transmission to said packet switch.

4,577,315
POWER SAVING SYSTEM FOR TIME-DIVISION MULTIPLE ACCESS RADIOCOMMUNICATION NETWORK

Shigeru Otsuka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,993
Claims priority, application Japan, Jul. 25, 1983, 58-135389
Int. Cl.[4] H04J 3/16; H04B 1/00, 7/00; G08B 5/22
U.S. Cl. 370—95 12 Claims



1. A power saving system for a time-division multiple access communication network having a first station and a plurality of second stations capable of individually establishing connections with said first station in response to a selection signal and relaying information signals through the established connections, the system comprising:

means for interleaving a power saving control signal at periodic intervals with said selection signal and said information signals and transmitting the interleaved signals from said first station to said second stations;

a plurality of means associated respectively with said second stations for individually cutting off power supplies to said second stations for a predetermined period in response to said control signal; and

means for detecting the moment a connection is being established, identifying the second station establishing the connection, and selectively inhibiting one of said power cut-off means associated with the identified second station from responding to said control signal, while allowing the remainder of said power cut-off means to respond to said control signal.

4,577,316
SYNCHRONIZATION SYSTEM FOR A REGENERATIVE SUBTRANSPONDER SATELLITE COMMUNICATION SYSTEM

Leonard N. Schiff, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

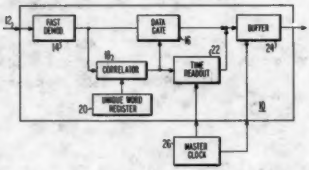
Filed Feb. 13, 1984, Ser. No. 579,608
Int. Cl.[4] H04J 3/06
U.S. Cl. 370—104 13 Claims

1. In a satellite communication system having a plurality of earth stations sharing an uplink carrier in a time division multiple access mode wherein one of said earth stations is designated

as a master earth station, the method of synchronizing the transmission from each earth station comprising the steps of:

determining the time of arrival at the satellite of the signal from each earth station; and

transmitting the time of arrival of the signals at the satellite to the earth stations; and



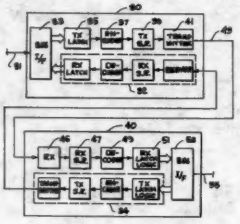
adjusting, if necessary, the time of transmission from at least one earth station so that the determined time of arrival of the signal at the satellite matches the optimum time of arrival for a properly synchronized transmission.

4,577,317

METHOD FOR EXTENDING A PARALLEL DATA BUS

Paul C. Chu, San Jose, and Gerald K. Mercola, Pleasanton, both of Calif., assignors to ICS Electronics Corporation, San Jose, Calif.

Filed Apr. 15, 1983, Ser. No. 485,162
Int. Cl.[4] H04J *3/12, 3/02*
U.S. Cl. 370—110.1 **6 Claims**



1. A method for serially transmitting a composite parallel frame between stations terminating local and remote parallel buses with a serial link therebetween comprising,

receiving a parallel frame at a local station,

decomposing the parallel frame into a data sub-frame and a management sub-frame, said management sub-frame including management bits from said parallel frame and a three bit local message for handshaking between stations, the three bits indicating the following states: ready for data, new byte available, and ready for next byte,

tagging said sub-frames with message codes to enable said stations to distinguish data sub-frames from management sub-frames,

serially transmitting a management sub-frame from the local to the remote station, said three bit local message of said management sub-frame indicating a new byte available, then

receiving a serially transmitted management sub-frame from the remote station at the local station, said three bit local message of said management sub-frame indicating ready for data, then

serially transmitting a data sub-frame from the local to the remote station and then

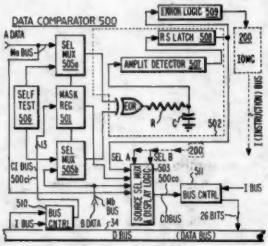
receiving a serially transmitted management sub-frame from the remote station at the local station acknowledging the data sub-frame received.

4,577,318

SELF TESTING DETECTION SYSTEM FOR COMPARING DIGITAL SIGNAL TRANSITION TIMES

James B. Whitacre, Westminster, and Peter P. Binoeder, Tustin, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 14, 1983, Ser. No. 551,081
Int. Cl.[4] G01R *15/12*
U.S. Cl. 371—1 **11 Claims**



1. In a mulitple line test system wherein each pair of first and second digital input signals from first and second source units are compared for skew in transition times to test whether each pair of first and second digital signals are within allowable tolerances, a multiple line-pair comparison system comprising:

(a) a plurality of comparison means, one each for each line-pair tested, each said comparison means for receiving each of said first and second digital input signals and for developing digital-difference output signals representing the time-difference beween the leading edges and trailing edges of each of said first and second digital input signals; each said digital difference output signals being transmitted to a discrete sensing means;

(b) a plurality of discrete sensing means connected for receiving each of said digital difference output signals and for generating an error output signal when said time-difference exceeds a preset value;

(c) processor means for initiating a skew self test means before each comparison in said comparison means of each line-pair of said first and second digital input signals and for receiving and identifying any of said error output signals from said plurality of discrete sensing means;

(d) common clock means for clocking each of said first and second digital input signals and for clocking said skew self test means;

(e) said skew self test means controlled by said processor means for checking the preset allowable skew tolerance and the preset non-allowable skew tolerance for each of said comparison means, said skew self test means including:

(e1) pass-delay circuit means for generating a pair of digital-pass signals for input to a select multiplexor means, said digital-pass signals having a skew differential within the allowable tolerance;

(e2) fail delay circuit means for generating a pair of digital-fail signals for input to a select mulitplexor means, said digital-fail signals having a skew differential beyond the allowable tolerance;

(f) said select multiplexor means for receiving said pairs of digital input signals, and for receiving said series of digital-pass signals and said series of digital-fail signals, and including:

(f1) select means, controlled by said processor means, for enabling passage of each of said pairs of digital input signals to each of said comparison means or for enabling passage of each of said series of digital-fail and digital-pass signals to each of said comparison means.

4,577,319
ERROR FLAG PROCESSOR

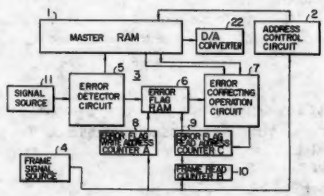
Takashi Takeuchi, Fujisawa; Keizo Nishimura, Yokohama; Masaharu Kobayashi, Yokohama, and Kazumasa Oiso, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 422,299, Sep. 23, 1982, abandoned. This application May 6, 1985, Ser. No. 730,258

Claims priority, application Japan, Sep. 30, 1981, 56-153702; Sep. 30, 1981, 56-153704; Sep. 30, 1981, 56-153706

Int. Cl.[4] G06F *11/10*; G11B *27/00*

U.S. Cl. 371—38 14 Claims



1. An error flag processor comprising:

(a) a master memory having areas for storage of a plurality of information word frames each comprised of a plurality of signal words and associated parity words determined from the signal words of a predetermined number of frames;

(b) error word detecting means for detecting error words within each information word frame on the basis of the associated parity words;

(c) an error flag storage means having the capacity for storing an error flag for each of said predetermined number of frames;

(d) error flag write means for successively writing error flags produced as a result of detection of errors in the input data in frames by the error word detecting means into the error flag storage means for each frame;

(e) error correcting means connected to said master memory and said error flag storage means for correcting error words within each word frame comprised of the signal words rearranged in an original time series sequence as identified by error flags from said error flag storage means; and

(f) error flag read means for reading from said error flag storage means error flags so as to be allotted to individual words of each rearranged signal word frame in association with signal words from said master memory into said error correcting means, whereby when data subject to de-interleave and read-out from said master memory is then subjected to a correcting operation by said error correcting means, error flag information allotted to individual words is read out of the error flag storage means by said error flag read means and the error words are corrected by said error correcting means in correspondence to receipt of an error flag.

4,577,320
LIGHT POWER CONTROLLING APPARATUS

Shoji Yoshikawa, and Masaharu Sakamoto, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 575,042

Claims priority, application Japan, Feb. 10, 1983, 58-21311

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—29 8 Claims

1. A light power controlling apparatus comprising:

semiconductor light emitting device;

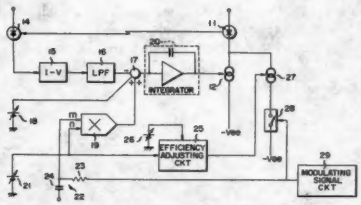
first current circuit means connected to said light emitting device and for feeding a first current to said light emitting device to cause said light emitting device to emit light;

photosensor means for producing an electrical signal corresponding to the emitted light from said light emitting device;

first averaging means for averaging a form factor of an electrical signal of said photosensor means and for generating an average signal corresponding to the averaged form factor;

error amplifier means for comparing said average signal of said averaging means with a reference signal corresponding to a desired value of light power, thereby to produce a difference signal representing a difference between the average value and said desired value;

integrator means for integrating said difference signal of said error amplifier means and for feeding the integrated signal as a feedback control signal to said first current circuit means;



means for generating a modulating signal in a modulating mode;

second current circuit means connected to said light emitting device and for feeding to said light emitting device a second current according to said modulating signal;

peak power setting means for setting said second current circuit means at a peak power value in a modulating mode;

second averaging means connected to said modulating signal generating means for averaging a form factor of said modulating signal to obtain a second average signal; and

means for adding to said desired value a signal representing the product of said peak power value and said second average signal and for feeding it as a reference signal to said error amplifier means.

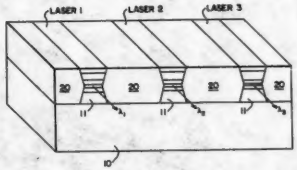
4,577,321
INTEGRATED QUANTUM WELL LASERS FOR WAVELENGTH DIVISION MULTIPLEXING

James K. Carney, Eden Prairie, and Robert M. Kolbas, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 19, 1983, Ser. No. 533,187

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—50 6 Claims

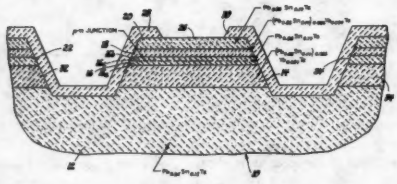


1. An integrated array of quantum well lasers which has a plurality of quantum well lasers for providing a plurality of light beams each having a different but known wavelength for use in wavelength division multiplexing comprising:

a single crystal semiconductor substrate having simultaneously grown thereon from a single growth sequence a plurality of compositionally identical epitaxial layers to

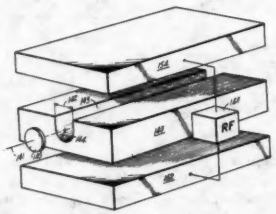
form quantum well heterostructure lasers, each of said plurality of quantum well lasers comprising:
a first cladding region grown on said substrate;
an active region of a determined thickness which includes alternating thin layers of narrow band-gap well layers and wide band-gap barrier layers followed by a final narrow band-gap well layer successively grown on said first cladding region,
wherein said determined thickness is different from one to the next of said plurality of quantum well lasers;
and a second cladding region grown on said active region, each of said quantum well lasers being electrically and optically isolated.

4,577,322
LEAD-YTTERBIUM-TIN TELLURIDE HETEROJUNCTION SEMICONDUCTOR LASER
Dale L. Partin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 19, 1983, Ser. No. 543,368
Int. Cl.[4] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—44 **4 Claims**



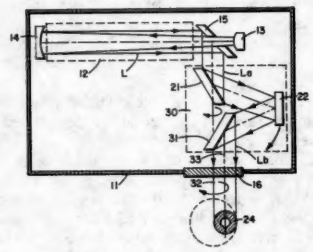
1. In a double heterojunction semiconductor lead salt infrared diode laser, the improvement wherein a semiconductive monocrystalline lead salt active region layer of given energy band gap, index of refraction, crystal structure and lattice constant is sandwiched between two semiconductive monocrystalline lead-tin ytterbium salt layers of mutually opposite conductivity type and having an energy band gap significantly higher than, an index of refraction significantly lower than, a crystal structure the same as, and a lattice constant substantially equal to said active region layer, effective to increase layer performance by providing lattice matching among said layers as well as providing carrier and optical confinement with respect to said active region layer.

4,577,323
U CHANNEL WAVEGUIDE LASER
Leon A. Newman, South Windsor, and John T. Kennedy, South Meriden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Sep. 6, 1983, Ser. No. 529,438
Int. Cl.[4] H01S *3/03, 3/09*
U.S. Cl. 372—64 **3 Claims**



1. An RF-powered waveguide laser comprising:
first and second electrodes having first and second parallel, facing electrode surfaces positioned on opposite sides of an optical axis;
an insulating member positioned between said first and second parallel electrode surfaces and containing an optical waveguide disposed about said optic axis;
reflective means for defining an optical cavity containing said waveguide;
a gain medium disposed within said optical cavity;
RF-pumping means for applying power to said electrodes for resonating, in at least one electromagnetic mode, laser radiation in said gain medium disposed within said optical cavity; characterized in that:
said optical waveguide has a cross section perpendicular to said optic axis that is asymmetric about said optic axis.

4,577,324
HIGH POWER OUTPUT LASER APPARATUS
Naoto Nishida, Yokohama; Tadashi Takahashi, Tokyo, and Katsuyuki Kakizaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed May 30, 1984, Ser. No. 615,335
Claims priority, application Japan, May 31, 1983, 58-94805
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—95 **6 Claims**



1. A laser oscillator apparatus comprising:
a laser medium flowing in one direction in a chamber;
an unstable resonator including a first mirror with a concave reflecting surface and second mirror with a convex reflecting surface, both of said reflecting surfaces facing each other in order to generate a laser beam transmitted in a direction perpendicular to the flowing direction of the laser medium; and
an output window provided in the chamber for the laser beam, and rotation means for rotating the laser beam disposed between the unstable resonator and the output window.

4,577,325
HYDRAULICALLY FORCING CONTACTS AGAINST ELECTRODES FOR ELECTROFURNACES
Theodor Mertin, Langenfeld, and Franz S. Hagen, Dinslaken, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Nov. 5, 1984, Ser. No. 668,037
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3340390
Int. Cl.[4] H05B *7/10*
U.S. Cl. 373—101 **5 Claims**

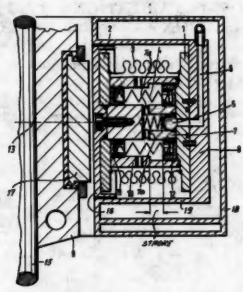
1. In an electrofurnace having an electrode, there being a cooled annular carrying ring provided for looping around the electrode, there being further at least one contact bracket for engagement with the electrode, a contact pressure producing device comprising:
a first bushing cover affixed to said carrier ring and having

a central opening, there being pressure conduit means for providing hydraulic fluid to said opening;

a second bushing cover disposed for force engagement with said contacts;

bellows interposed between said first and second bushing covers and connected thereto;

resilient spring means interposed between said first and second bushing covers inside said bellows and providing a



resilient force in opposition to any hydraulic force in the interior of the bellows tending to spread the two covers apart; and

check valve means arranged in the interior of said bellows and mounted to a holding element affixed to said second cover for opening and closing said opening in said first cover, but being carried along whenever the pressure in the bellows exceeds a particular value.

4,577,326

DC ARC FURNACE HEARTH CONNECTION

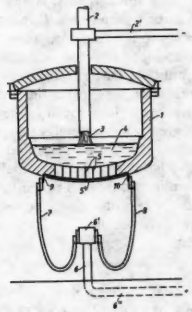
Kjell Bergman, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 20, 1984, Ser. No. 622,589

Claims priority, application Sweden, Jul. 7, 1983, 8303879

Int. Cl.[4] H05B 7/11

U.S. Cl. 373—103 **2 Claims**



1. A DC arc furnace having a vertical arcing electrode adapted to be connected with a negative current lead and a hearth adapted to contain a melt below the electrode and having a hearth electrode comprising a plurality of vertical metal conductors extending through the hearth in the form of a cluster, the hearth electrode extending laterally from the axis of the arcing electrode symmetrically with respect to the axis and having a plurality of electrical connections extending to the outside of the hearth and spaced laterally from the arcing electrode's axis symmetrically with respect to the axis, the connections being adapted for connection with a positive current lead and application of DC to the electrodes powering an arc between the arcing electrode and melt; wherein the improvement comprises a positive current lead below the bottom of the hearth and having an upper end positioned on the arcing electrode's axis below the hearth's bottom and extending from the positive current lead's upper end vertically downwardly on the axis to a low position where the magnetic field of the positive current lead cannot appreciably affect the arc, the positive current lead extending substantially horizontally from its low position to a position offset from the hearth, the positive current lead's upper end having electrical conductors extending from it to the electrical connections of the hearth electrode and which are symmetrical with respect to the arcing electrode's axis.

4,577,327

DATA TRANSMISSION INCLUDING A REPEATER

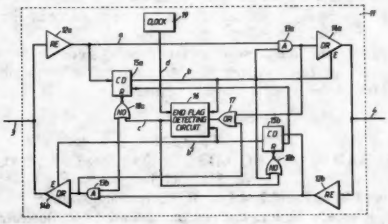
Shigeo Nambu, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 1, 1984, Ser. No. 656,761

Claims priority, application Japan, Sep. 30, 1983, 58-182656

Int. Cl.[4] H04L 5/16

U.S. Cl. 375—4 **4 Claims**



4. A method of transferring signals between stations connected to lines on opposite sides of a repeater, said method comprising the steps of:

(a) monitoring for a signal passing through said repeater;

(b) inhibiting signals passing through said repeater in a direction opposite said signal monitored by said step (a) in response to said step (a);

(c) monitoring said signal for a predetermined characteristic of the end of said signal; and

(d) stopping said inhibiting step (b) in response to said monitoring step (c).

4,577,328

METHOD AND CIRCUIT FOR DETECTING A TRAINING SIGNAL

Kelichi Senoo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,264

Claims priority, application Japan, Oct. 30, 1982, 57-190028

Int. Cl.[4] H03H 7/30, 7/40

U.S. Cl. 375—13 **2 Claims**

1. A method of detecting a training signal for use in initial adjustment of an automatic equalizer with respect to channel characteristics, comprising the steps of:

(a) receiving and shifting a demodulated training signal in synchronism with data modulating rate, said training signal comprising at least two periodic data sequences each having a period L and the autocorrelation function of said periodic data sequence assumes an impulse;

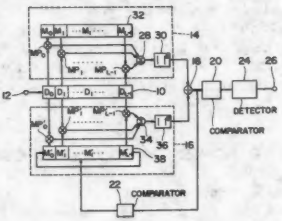
(b) calculating the correlation between said demodulated training signal and a first periodic data sequence with the period L, and obtaining a first square value indicative of said correlation;

(c) calculating the correlation between said demodulated training signal and a second periodic data sequence and

obtaining a second square value indicative of said correlation, wherein said second periodic data sequence is circulated in synchronism with the data modulating rate and has the same sequence as said first data sequence;

(d) dividing said first square value by said second square value;

(e) comparing the quotient obtained in the step (d) with a first and second threshold values;



(f) setting the order of said second periodic data sequence to the order of said first periodic data sequence shifted by one, if said quotient exceeds the second threshold value;

(g) producing a signal if said quotient exceeds the first threshold value; and

(h) detecting the presence of said training signal by detecting said at least two periodic data sequences occuring at a time interval equal to said period L.

4,577,329

SELF-ADAPTIVE EQUALIZER FOR BASEBAND DATA SIGNALS

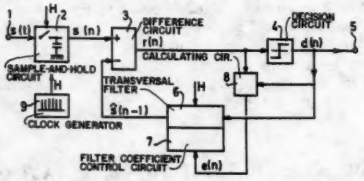
Richard Brie, Paris, and Loic B. Y. Guidoux, Garancieres, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Oct. 6, 1983, Ser. No. 539,582

Claims priority, application France, Oct. 11, 1982, 82 16997

Int. Cl.[4] H04B *3/04;* H03H *7/30;* H03K *5/159*

U.S. Cl. 375—14 **10 Claims**



1. In a self-adaptive equalizer for use in the receiver of a data modem for correcting in the base-band the data signal received, such equalizer being of the kind comprising a difference circuit to which is applied the received signal and a correction signal formed at a sampling frequency by a transversal filter having adjustable coefficients, the difference circuit producing a corrected signal which is applied to a decision circuit for recovering the data signal, the recovered data signal being applied to the input of the transversal filter, the coefficients of the transversal filter being adjusted so as to minimize a predetermined function of an error signal, the improvement characterized in that the equalizer comprises means for adjusting the coefficients of the transversal filter in accordance with an error sampling signal, such error signal being formed at each actual sampling instant n by deriving the algebraic difference between the value of the corrected signal produced by the difference circuit at the sampling instant and the value of the corrected signal produced by the difference circuit at a previous sampling instant, the latter value first being multiplied by the ratio between the value of the recovered data signal at the actual sampling instant and the value of the recovered data signal at the previous sampling instant; such adjustment of the coefficients being effected only for sampling instants at which the said two values of the recovered data signal both differ from zero.

4,577,330

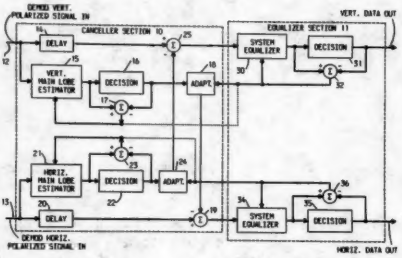
CROSS-POLARIZATION INTERFERENCE CANCELLATION ARRANGEMENT FOR DIGITAL RADIO CHANNELS

Mohsen Kavehrad, Hudson, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 19, 1984, Ser. No. 602,055

Int. Cl.[4] H03H *7/30*

U.S. Cl. 375—15 **6 Claims**



1. A cross-polarization interference cancellation arrangement comprising:

a first and a second input terminal capable of receiving a first and a second orthogonally polarized baseband digital input signal, respectively;

a first and a second output terminal;

canceller means connected to the first and second input terminals and responsive to a received first and second orthogonally polarized baseband input signal for determining therefrom a first and a second estimate, respectively, of a main lobe of a pulse response of the respective first and second input signals, and for generating from the first and second estimates a respective first and second cancellation output signal of a proper phase and amplitude which is introduced into the second and first orthogonally polarized input signals, respectively, to generate respective second and first canceller means output signals wherein the main lobe of an interfering orthogonally polarized signal is substantially cancelled; and

equalizer means responsive to the first and second canceller means output signals for substantially equalizing therein any intersymbol and cross-rail interference components for providing a resultant first and second equalizer means output signal to the first and second output terminals, respectively.

4,577,331

MULTIPLE RATE BASEBAND TRANSMITTER

Dana A. Merrill, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 23, 1984, Ser. No. 583,084

Int. Cl.[4] H04L *27/04*

U.S. Cl. 375—17 **13 Claims**

1. A baseband transmitter for transmitting bipolar data on a transmission line comprising:

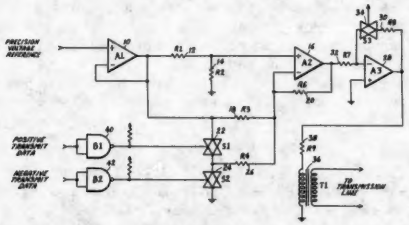
a source of two unipolar data signals;

a precision voltage reference for controlling the pulse amplitude of said bipolar data;

first amplifier means for generating a positive or a negative pulse output in response to a switched input data signal at

one input and said precision voltage input on the other input thereto;

first switch means having a channel resistance and for generating said switched input data signal in response to said unipolar data signals;

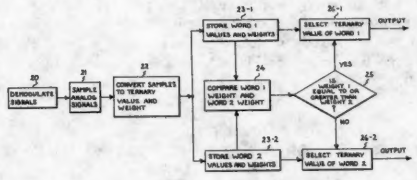


second amplifier means coupled to the output of said first amplifier means for generating amplified bi-polar data having a controlled pulse amplitude, and second switch means in parallel with an input and the output of said second amplifier means for providing compensation for the channel resistance of said first switch means, and having a channel resistance.

4,577,332
DIGITAL DECODING ARRANGEMENT

Theodore Brenig, Lynchburg, Va., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,788
Int. Cl.[4] H04L *1/02*
U.S. Cl. 375—40 **6 Claims**



1. An arrangement for decoding analog signals forming a binary meassage and transmitted at least twice in sequence, comprising:

a. means for producing a first digital value signal in response to each received analog signal above a selected level and for producing a second and different digital value signal in response to each received analog signal below said selected level;

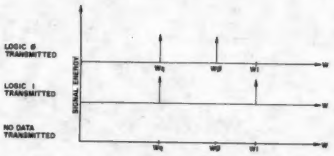
b. means for producing a wighting factor that is related to the deviation of each received analog signal from said selected level;

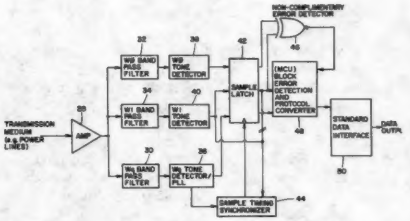
c. and means for selecting one digital value signal produced from corresponding and repeated analog signals, said one selected digital value signal having the highest weighting factor associated therewith.

4,577,333
COMPOSITE SHIFT KEYING COMMUNICATION SYSTEM

Kenneth A. Lewis, Essex Junction, Vt., and Alan N. Alpern, Manhattan, N.Y., assignors to GridComm Inc., Danbury, Conn.

Filed Sep. 13, 1984, Ser. No. 650,777
Int. Cl.[4] H04L *27/30*
U.S. Cl. 375—45 **22 Claims**





1. A composite shift key method of communication for binary signals, comprising:

a. transmitting a summed signal having a qualifying signal at a qualifying signal frequency Wqt as one of the summed signal components only when binary data, either a binary zero or a binary one, is desired to be transmitted, by algebraically summing a first signal at

b. a first frequency W1 with the qualifying signal at the qualifying signal frequency Wqt, to produce a first summed signal which is transmitted when a binary one is desired to be transmitted, such that a binary one transmitted signal is a composite summed signal of Wqt and W1, and by algebraically summing a second signal at

c. a second frequency W0 with the qualifying signal at the qualifying signal frequency Wqt, to produce a second summed signal which is transmitted when a binary zero is desired to be transmitted, such that a binary zero transmitted signal is a composite summed signal of Wqt and W0; and

d. ceasing transmission of the qualifying signal at the qualifying signal frequency Wqt as a transmitted signal or as a component of a composite summed signal when neither a binary zero nor a binary one is desired to be transmitted.

4,577,334
DIGITAL DATA RECEIVER INCLUDING TIMING ADJUSTMENT CIRCUIT

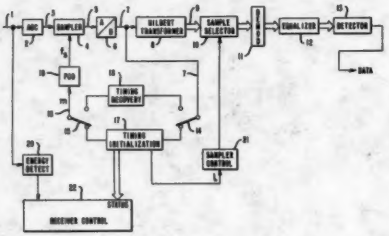
Jan Boer, Utrecht, and Wilhelmus J. M. Diepstraten, Diessen, both of Netherlands, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 9, 1984, Ser. No. 670,425
Claims priority, application United Kingdom, Jan. 13, 1984, 8400922
Int. Cl.[4] H04L *7/10*
U.S. Cl. 375—97 **12 Claims**

1. In a data receiving apparatus for receiving a data modulated carrier signal and including a sampling circuit responsive to sampling clocks for sampling the received signal, a phase controlled oscillator for developing the sampling clocks, and

an analog-to-digital converter for converting the sampled received signal to a digitized sampled received signal, a timing adjustment system comprising:

a signal transform circuit including first and second Discrete Fourier Transform filter circuits and adapted to provide first and second complex signals as a function of the correlation between said digitized sampled received signal and each of first and second predetermined locally generated frequencies having values of $f_c-\frac{1}{2}f_b$ and $f_c+\frac{1}{2}f_b$, respectively, where f_c and f_b are the carrier frequency and the modulation frequency, respectively;



complex conjugate multiplier means being responsive to said first and second complex signals for providing a complex output signal; and

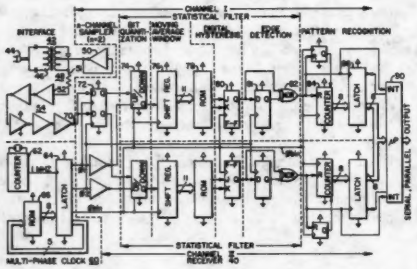
conversion means responsive to said complex output signal for applying an adjustment signal to said phase controlled oscillator to selectively adjust the phase of said sampling clocks to define the sampling instants at which said received signal is sampled.

4,577,335

COHERENT DATA COMMUNICATIONS TECHNIQUE

Hee Wong, San Jose, and Carson Chen, San Bruno, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 9, 1984, Ser. No. 569,358
Int. Cl.⁴ H03D *3/22*
U.S. Cl. 375—86 **13 Claims**



1. A receiver for reconstructing data from a received phase modulated transmission comprising:

a multiphase clock generator for generating n sample clock signals at the same frequency and phase offset from each other by 360°/2n, and for generating a bin clock signal at a frequency equal to the sample clock frequency divided by a first predetermined number;

n channels, each connected to receive a respective sample clock signal and the phase modulated transmission and each including

sampler means, responsive to said received phase modulated transmission, to take one sample of the received transmission in response to each sample clock signal and to provide high and low sample output signals for digitally driving each of said n channels as a function of the related clock signal;

a statistical filter, responsive to said sample output signal; and including counter means responsive to said bin clock signal to produce an average bin value for the first predetermined number of consecutive samples; and moving average means responsive to said bin clock signal to form moving average values of a second predetermined number of consecutive bins; and

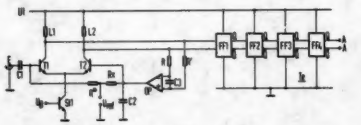
pattern recognition means to assign data bit values to predetermined patterns of said moving average values.

4,577,336

INTEGRABLE FREQUENCY DIVIDER CIRCUIT HAVING A FEEDBACK CONTROLLED DIFFERENTIAL AMPLIFIER AS ITS PREAMPLIFIER CIRCUIT

Hans Kriedt, Munich, and Josef Fenk, Eching-Ottenburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 435,416, Oct. 20, 1982. This application May 20, 1985, Ser. No. 736,401
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141790
Int. Cl.⁴ H03K *21/02, 21/40, 23/58;* H03F *1/34*
U.S. Cl. 377—111 **8 Claims**



1. Integrable frequency divider circuit, comprising a preamplifier in the form of a differential amplifier having at least one stage and having a signal input for receiving signals to be processed, a reference input and two outputs, a frequency divider having divider stages including a first divider stage, each being in the form of identical series-connected flip-flop cells, said first divider stage having two inputs each being connected to a respective one of said two outputs of said differential amplifier for receiving the signals to be processed, an operational amplifier having an output directly connected to said reference input of said differential amplifier and having two inputs, two resistors each being connected between a respective one of said inputs of said operational amplifier and a respective one of said outputs of said differential amplifier, and a capacitor connected between said inputs of said operational amplifier.

4,577,337

X-RAY FLUORESCENCE TESTING OF LAMINATE STRUCTURES

Glenn M. Light, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed May 21, 1984, Ser. No. 612,477
Int. Cl.⁴ G01N *23/223*
U.S. Cl. 378—044 **20 Claims**

1. An X-ray fluorescence test method for detecting, locating and quantifying impact caused delaminations and subsurface cracks in a laminate with an X-ray fluorescence source-detector comprising:

placing a substantially uniform layer of a test coating on the surface of a test portion of said laminate, said test coating being comprised of a penetrant of low viscosity and low surface tension which is capable of penetrating the surface breaking cracks associated with impact caused delaminations and subsurface cracks in said laminate and at least one element of high atomic number (Z) which is detectable by said X-ray fluorescence source-detector;

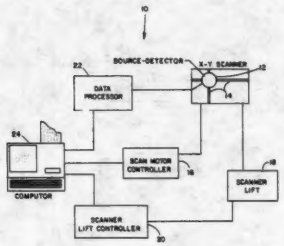
leaving said test coating upon said surface for a sufficient period of time to allow said penetrant to penetrate said delaminations and subsurface cracks and carry sufficient amounts of said high atomic number (Z) element into said delaminations and cracks to be detectable by said X-ray fluorescence source-detector after said test coating is removed from said surface;

removing said test coating from said surface;

testing said test portion of said laminate with said X-ray fluorescence source-detector for significant X-ray fluorescence;

detecting said delaminations and subsurface cracks, if any, by using any said significant X-ray fluorescence as an indication of a delamination or crack in said test portion;

locating said delaminations and subsurface cracks by moving said X-ray fluorescence source-detector along said surface of said test portion, observing which areas emit significant



X-ray fluorescence and using said significant X-ray fluorescence from any given area of said surface as an indication that a said delamination or subsurface cracking is located in said area; and

quantifying said delamination and subsurface cracking by determining the boundaries of said delaminations and subsurface cracks by moving said X-ray fluorescence source-detector to locate the parameters of said significant X-ray fluorescence and deeming said significant X-ray fluorescence parameters to be the boundaries of said delaminations and subsurface cracks and by determining the severity of said delaminations and subsurface cracks by measuring the intensity of said X-ray fluorescence from said delaminations and subsurface cracks and deeming the relative intensity of said X-ray fluorescence to be indicative of the relative severity of said delaminations and subsurface cracks.

4,577,338

X-RAY FLUORESCENCE SPECTROMETER AND METHOD OF CALIBRATING THE SAME

Yoshihiro Takahashi, and Maria A. Rey, both of San Jose, Calif., assignors to Xertex Corporation, Santa Clara, Calif.

Filed Nov. 1, 1982, Ser. No. 438,008
Int. Cl.⁴ G01N *23/223*
U.S. Cl. 378—048 **20 Claims**

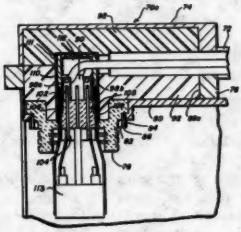
1. In a method of determining the sulfur content of a sample, the steps of: exciting the sample with x-rays of predetermined energy level to provide fluorescent energy corresponding to the elemental content of the sample and to the target line x-rays scattered by the sample, sampling the fluorescent energy in regions corresponding to the energy level of sulfur and to the energy level of the scattered target line x-rays, converting the sampled fluorescent energy to an electrical signal representative of the sulfur content of the sample, and calculating the sulfur content of the sample in accordance with a predetermined relationship.

4,577,339

CABLE TERMINATION FOR X-RAY TUBES

Heinrich F. Klostermann, 1326 Hoover St., Apt. 10, Menlo Park, Calif. 94025

Filed Oct. 28, 1983, Ser. No. 546,615
Int. Cl.⁴ H01J *35/00*; H01R *13/46*
U.S. Cl. 378—121 **12 Claims**



1. An improvement in x-ray tubes of the type comprising a metal tube envelope, a rotating anode assembly therein and drive means for it, a cathode and power supply means for the anode and cathode including supply cables, the improvement comprising terminal means for connecting the supply cables to the anode and cathode, including:

an insulating stud sealed to and extending through the generally flat end wall of the tube envelope, the insulating stud having a flat surface perpendicular to the end wall on the outside of the tube envelope;

(b) plug receptacles mounted in the flat surface of the stud, and wire means embedded in the stud and extending from the plug receptacles to the interior of the tube for connection with the anode or cathode;

(c) metal shield means secured to the tube end wall, the metal shield having a first end surrounding the protruding stud and a second open end spaced apart therefrom;

(d) insulating material within the metal shield and defining an opening extending from the flat surface of the insulating stud to the open end of the metal shield; and

(e) a terminal end fitting receiving the supply cable and including pins extending from the end thereof, the terminal end being sized to fit into the opening in the insulating material with the pins received in the plug receptacles.

4,577,340

HIGH VACUUM ROTATING ANODE X-RAY TUBE

Roland W. Carlson, Lyndhurst, and Edward A. Blaskis, Hudson, both of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Sep. 19, 1983, Ser. No. 533,706
Int. Cl.⁴ H01J *5/30*; F16J *9/00, 15/00*; E21B *33/00*
U.S. Cl. 378—132 **3 Claims**

1. In a CT scanner, a high voltage high vacuum rotating anode X-ray tube comprising:

(a) a anode adapted for rotation about an axis therethrough, the anode having a rotor and a shaft extending therefrom;

(b) a housing enclosing portions of said rotor and defining therewithin an evacuated region of high vacuum;

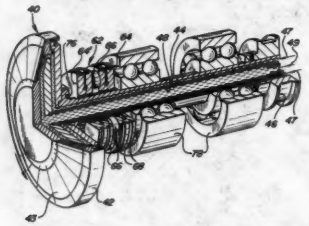
(c) an electron gun fixedly mounted through said housing, said electron gun adapted and configured to emit a beam

of electrons to be incident in said region on the rotor of said anode for generating X-rays;

(d) fluid magnetic sealing means disposed about the shaft of said anode for fluidically sealing the high vacuum in said region while permittting rotation of said anode;

(e) bearing means disposed about said shaft outside of said high vacuum region for transmitting rotary motion through said sealing means;

(f) window means formed on said housing for permitting transmission of X-rays through said housing; and



(g) an annular static seal disposed on said rotor within the high vacuum region;

(h) wherein said magnetic sealing means comprises a pair of annular pole pieces separated by a plurality of magnets, said pole pieces fitted about the shaft of said anode, with vacuum sealing between said pole pieces and the shaft provided by a magnetic fluid and further comprising means for maintaining the pressure imtermediate the two pole pieces at a relatively low pressure of or below approximately 100 millibars.

4,577,341

DIAPHRAGM ARRANGEMENT FOR X-RAY SPOT-FILM DEVICE

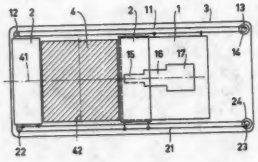
Horst H. Schwieker, and Kurt Gieschen, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,931

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209683

Int. Cl.⁴ G21K *1/02, 1/04*

U.S. Cl. 378—150 **11 Claims**



1. A diaphragm arrangement for an X-ray spot film device, said diaphragm arrangement comprising:

a first diaphragm having a first axis and having at least two rectangular apertures therein along the axis, said first diaphragm being displaceable in the direction of its axis, each rectangular aperture having a different size;

a second diaphragm having a second axis transverse to the first axis, said second diaphragm defining an aperture having edges parallel to the second axis, said second diaphragm being arranged to overlap the first diaphragm so that the two diaphragms selectively define an exposure field wherein said first diaphragm defines a dimension in the direction of said second axis and said second diaphragm defines a dimension in the direction of said first axis; and

motor means for displacing the first diaphragm along said first axis.

4,577,342

DISTORTION CANCEL CIRCUIT IN FM STEREO

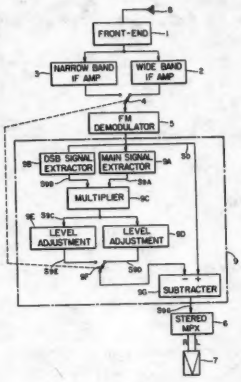
Michinori Naito, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1984, Ser. No. 584,881

Claims priority, application Japan, Mar. 4, 1983, 58-30555[U]

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—13 **4 Claims**



1. A distortion cancel circuit in an FM stereo receiver having an IF stage, comprising:

an input terminal at which is received an FM stereo demodulation signal which contains a distortion component generated in said IF stage;

an output terminal connected to an input of an FM MPX circuit;

a circuit for synthesizing a canceling signal to eliminate said distortion component generated in said IF stage by multiplying a main signal and a subsignal of said FM stereo demodulation signal at said input terminal;

a circuit for adjusting the level of said synthesized canceling signal; and

a circuit for subtractively combining said canceling signal whose level was adjusted with said FM stereo demodulation signal.

4,577,343

SOUND SYNTHESIZER

Toshio Oura, Tokyo, Japan, assignor to Nippon Electric Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 214,931, Dec. 10, 1980, abandoned. This application Sep. 12, 1983, Ser. No. 531,195

Claims priority, application Japan, Dec. 10, 1979, 54-159909

Int. Cl.⁴ G10L *1/00*

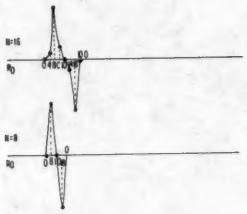
U.S. Cl. 381—51 **7 Claims**

1. A sound synthesizer comprising:

memory means for storing waveform information obtained by normalizing, along a time axis, one repeated waveform extracted from a group of waveforms repeatedly appearing a plurality of times within a speech sound waveform, said group of waveforms being substantially similar in configuration to each other, the extracted waveform information being stored at a group of memory locations of a predetermined number in said memory means, and for storing a plurality of groups of amplitude information for

designating amplitude levels of said repeatedly appearing waveforms;

means for designating a number of memory locations for said waveform information to be read out of said memory means, said number of designated memory locations being equal to said predetermined number of memory locations when a speech sound having the same tone frequency as that of a recorded speech sound is to be synthesized, and said number of designated memory locations being less than said predetermined number of memory locations when a speech sound having a tone frequency higher than that of said recorded speech sound is to be synthesized, the ratio of said designated number to said predetermined number depending upon the frequency of the tone of the speech sound to be synthesized;



means for reading said waveform information from the designated memory locations and for reading a designated group of amplitude information out of said memory means at a fixed rate regardless of the tone frequency of the speech sound to be synthesized;

means for defining a multiplying interval for said designated group of amplitude information;

means for producing a speech sound data by multiplying said read-out waveform information by said designated group of amplitude information during said defined multiplying interval;

means for setting a start value of one of the produced speech sound data and an end value of a next one of the produced speech sound data to be zero; and

means for sequentially linking said one of said speech sound data to said next one of said speech sound data adjacent thereto.

4,577,344

VISION SYSTEM

Theodore L. Warren, Westford; Kenneth R. Whelan, Medfield, and Arnold G. Reinhold, Cambridge, all of Mass., assignors to Automatix Incorporated, Billerica, Mass.

Filed Jan. 17, 1983, Ser. No. 458,729

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—1 **19 Claims**

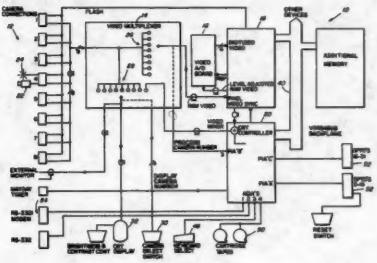
1. A system for sensing, processing and analyzing images, said system comprising:

(a) a plurality of camera means for sensing images and generating video signals defining said sensed images;

(b) vision processing means communicating with said camera means for processing said video signals, said vision processing means including at least two central processing units, shared memory means for storing said video signals during all stages of processing of said video signals and internal bus means communicating with each said central processing unit and with said shared memory means;

(c) external bus means communicating with said vision processing means, said external bus means providing communication with at least the shared memory means;

(d) computer controller means communicating with said shared memory means through said external bus means, said computer controller means at least generating command signals for controlling said vision processing means;



(e) display means connected to said computer controller means, selected image signals being presented on said display means; and,

(f) switch means for selectively switching said video signals generated by said camera means, selected ones of said video signals being applied to said vision processing means and said display means.

4,577,345

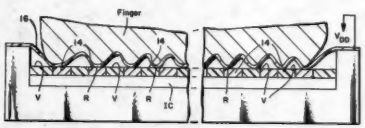
FINGERPRINT SENSOR

Igor Abramov, 3620 Spencer St., #50, Torrance, Calif. 90503

Filed Apr. 5, 1984, Ser. No. 597,124

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—4 **6 Claims**



1. A method for sensing the ridge and valley fingerprint pattern of a person's finger and translating said pattern into electrical signals representative thereof, including the steps of:

stretching a membrane having a conductive surface over an array of electrically conductive contact pads which are electrically insulated from each other and arranged so that each contact pad defines an "X,Y" coordinate of said array, the conductive surface being opposite said pads and spaced therefrom so it is not in electrical contact therewith;

connecting a separate electronic switching circuit to each of said pads;

pressing the person's finger against said membrane such that the ridge portions of said person's fingerprint pattern forces the membrane into electrical contact with the pads there-opposite, thereby activating the electronic switching circuits connected to said pads; and

scanning the electronic switching circuits to generate an electrical output signal in accordance with the activated and nonactivated switching circuits which represents the fingerprint pattern.

282,980
CAP
Paul Hayton, R.R. #2, Holland Centre, Ontario, Canada NOH 1R0
Filed May 28, 1985, Ser. No. 737,883
Claims priority, application Canada, Jan. 22, 1985, 22-01-85-4
Term of patent 14 years
U.S. Cl. D2—248

282,981
MITTEN
Melinda J. Pierce, 8851 Midvale No., No. 1, Seattle, Wash. 98103
Filed Jun. 16, 1983, Ser. No. 504,923
Term of patent 14 years
U.S. Cl. D2—367

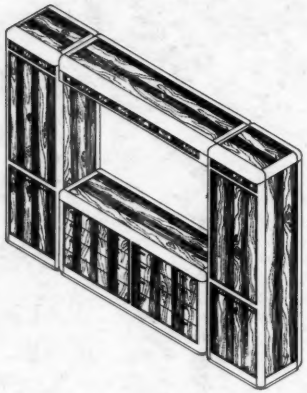
282,982
INFORMATION INDICATOR FOR ATTACHMENT TO A GARMENT HANGER
John Kodet, 225 West St., Carlton, New South Wales, Australia
Filed May 24, 1983, Ser. No. 497,614
Claims priority, application Australia, Feb. 12, 1982, 2256/82
Term of patent 14 years
U.S. Cl. D6—328

282,983
SIDE CHAIR
Rick Bart, 397 Wenham Rd., Pasadena, Calif. 91107
Filed Aug. 18, 1983, Ser. No. 524,260
Term of patent 14 years
U.S. Cl. D6—369

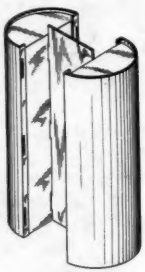
282,984
SIDE CHAIR
Rick Bart, 397 Wenham Rd., Pasadena, Calif. 91107
Filed Aug. 18, 1983, Ser. No. 524,494
Term of patent 14 years
U.S. Cl. D6—369

282,985
CHAIR FRAME
Jeffrey P. Cronk, Los Angeles, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Aug. 8, 1983, Ser. No. 521,207
Term of patent 14 years
U.S. Cl. D6—373

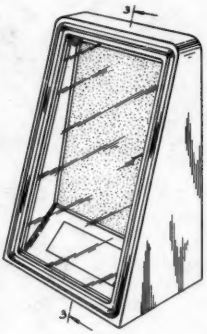
282,986
COMBINED DUAL ARMOIRE, BRIDGE AND DRESSER UNIT
Huey T. Keller, High Point, N.C., assignor to Bernhardt Industries, Inc., Lenoir, N.C.
Filed Oct. 17, 1983, Ser. No. 542,784
Term of patent 14 years
U.S. Cl. D6—397



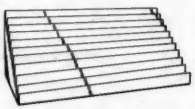
282,987
DISPLAY RACK
Richard T. Cohen, New York, N.Y., assignor to Melrose Displays, Inc., Passaic, N.J.
Filed Sep. 2, 1982, Ser. No. 414,488
Term of patent 14 years
U.S. Cl. D6—449



282,988
DISPLAY CASE
Russell Woolard, Flixton, England, assignor to Petrus Products Limited, Manchester, England
Filed Jun. 24, 1983, Ser. No. 507,484
Claims priority, application United Kingdom, Mar. 3, 1983, 8305963; Apr. 26, 1983, 1012714
Term of patent 14 years
U.S. Cl. D6—471



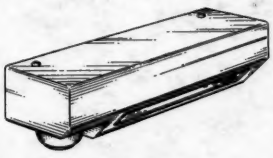
282,989
TAPE RACK
Ronald M. Nelson, 682 Costa Dr., Napa, Calif. 94558
Filed Jul. 1, 1983, Ser. No. 510,067
Term of patent 14 years
U.S. Cl. D6—474



282,990
LUMBAR SUPPORT CUSHION
Julian Sims, 350 E. 54th St., New York, N.Y. 10022, and Steven Joseph, 40 Willis Ave., Staten Island, N.Y. 10301
Filed Jan. 3, 1983, Ser. No. 455,246
Term of patent 14 years
U.S. Cl. D6—502

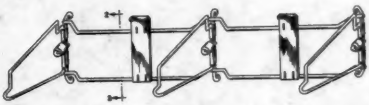
282,991
DETACHABLE TRAY
Richard C. Wellington, Woodcliff Lake, N.J., assignor to Wellington Home Products, Paterson, N.J.
Filed Oct. 21, 1983, Ser. No. 544,220
Term of patent 14 years
U.S. Cl. D6—511

282,992
COMBINED CUP AND TOWEL DISPENSER
Randall N. Bortlett, Bay Minette, Ala., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 515,000
Term of patent 14 years
U.S. Cl. D6—516

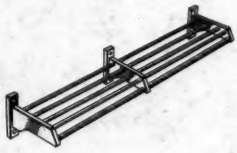


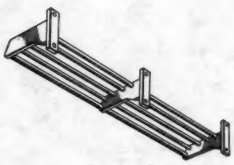
282,993
COMBINED MIRROR AND SHAVING GEAR HOLDER
Ronald W. Sanford, Great Neck, N.Y., assignor to Brooks/Kendall, Ltd., Great Neck, N.Y.
Filed Mar. 22, 1984, Ser. No. 592,178
Term of patent 14 years
U.S. Cl. D6—526

282,994
BAG HOLDER OR THE LIKE
Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 259,220, Apr. 30, 1981, Pat. No. Des. 271,067. This application Mar. 30, 1983, Ser. No. 480,193
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—566

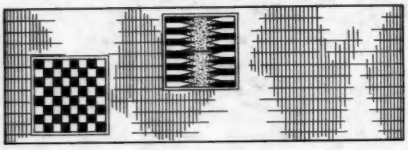


282,995
WALL MOUNTED RACK
Keith J. Beverly, c/o Beverly Coat Hanger Co., Inc., 1215 Fairfax Ave., San Francisco, Calif. 94124
Filed Aug. 22, 1983, Ser. No. 525,013
Term of patent 14 years
U.S. Cl. D6—566

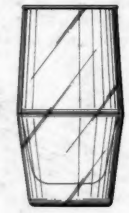




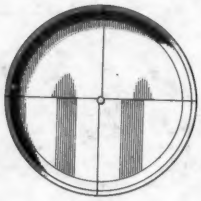
282,996
GRASS-WEED LYING MAT
Herbert W. Bösenberg, Annastrasse 25, D-6100 Darmstadt, Fed. Rep. of Germany
Filed Feb. 23, 1983, Ser. No. 468,968
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 8 MR 847; Feb. 3, 1983, 8 MR 867
Term of patent 14 years
U.S. Cl. D6—588

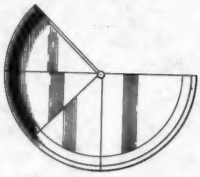


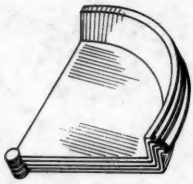
282,997
TUMBLER OR SIMILAR ARTICLE
Lawrence J. Miller, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 20, 1983, Ser. No. 543,716
Term of patent 14 years
U.S. Cl. D7—6



282,998
COLLAPSIBLE PLATE
Barbara J. Ransom, 8005 Lichen Dr., Citrus Heights, Calif. 95621
Filed Apr. 25, 1983, Ser. No. 488,093
Term of patent 14 years
U.S. Cl. D7—23



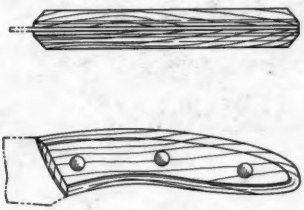




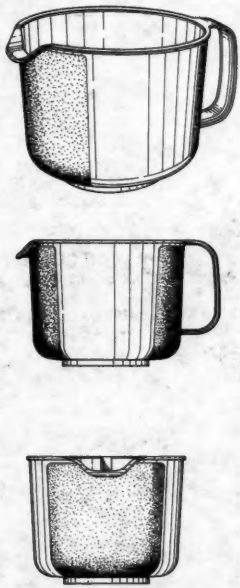
282,999
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 21, 1983, Ser. No. 544,087
Term of patent 14 years
U.S. Cl. D7—137

283,000
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 5, 1983, Ser. No. 558,009
Term of patent 14 years
U.S. Cl. D7—137

283,001
KNIFE HANDLE
Robert Pashley, Lake Geneva, Wis.; Mary E. Burke, Crystal; William Peters, Maple Grove, both of Minn.; Robert L. Jacobi, Lake Geneva, Wis., and Ronald J. Gangelhoff, Mound, Minn., assignors to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed May 13, 1983, Ser. No. 494,298
Term of patent 14 years
U.S. Cl. D7—152



283,002
MIXING BOWL OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 18, 1983, Ser. No. 485,679
Term of patent 14 years
U.S. Cl. D7—319



283,003

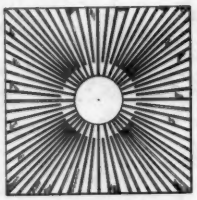
TREE GRATE

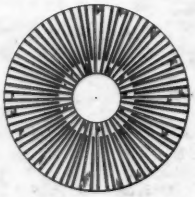
DeWitt McKinley, Forth Worth, Tex., assignor to McKinley Tree Grate Co., Inc., Fort Worth, Tex.

Filed Dec. 29, 1983, Ser. No. 566,894

Term of patent 14 years

U.S. Cl. D8—1





283,004

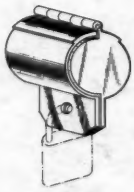
DOOR LOCK GUARD

Richard E. Parker, 1417 Nebraska Ave., Palm Harbor, Fla. 33563

Filed Mar. 16, 1983, Ser. No. 475,929

Term of patent 14 years

U.S. Cl. D8—322



283,005

DUAL WHEEL COMBINATION LOCK FOR LUGGAGE OR SIMILAR TYPE ARTICLE-RETAINING CONTAINER

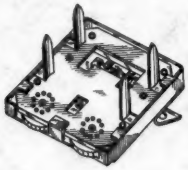
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Oberdorf, Switzerland

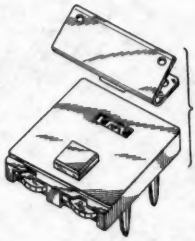
Filed Jan. 27, 1983, Ser. No. 461,470

Claims priority, application d Int. Prop. O., Nov. 16, 1982, 72755

Term of patent 14 years

U.S. Cl. D8—331





283,006

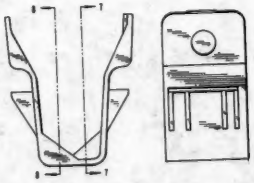
HOLD DOWN BRACKET

Joseph A. Carter, Jr., 3263 Roxburg Dr., Lexington, Ky. 40503, and Paul R. Everhard, Lexington, Ky., assignors to Joseph A. Carter, Jr., Lexington, Ky.

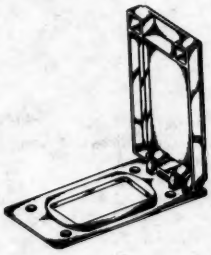
Filed May 17, 1983, Ser. No. 495,522

Term of patent 14 years

U.S. Cl. D8—349



283,007
ELECTRICAL OUTLET COVER PLATE ENCLOSURE THEREFOR
Daniel P. Henkel, Kunkletown, Pa., assignor to Square D Company, Palatine, Ill.
Continuation-in-part of Ser. No. 307,407, Oct. 1, 1981, Pat. No. D. 273,084. This application Nov. 3, 1983, Ser. No. 548,521
The portion of the term of this patent subsequent to Mar. 20, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—353



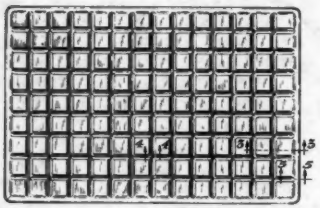
283,008
GUY HOOK FOR ATTACHMENT TO TRANSMISSION LINE POLES OR THE LIKE
Gaddis G. Hall, P.O. Box 6699, Birmingham, Ala. 35210
Filed Aug. 22, 1983, Ser. No. 525,131
Term of patent 14 years
U.S. Cl. D8—356

283,009
BEVERAGE CONTAINER
Dale A. Jennette, 505 Wild Oak Ct., Louisville, Ky. 40222
Filed Nov. 2, 1983, Ser. No. 547,992
Term of patent 14 years
U.S. Cl. D9—307

283,010
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Inc., Boyertown, Pa.
Filed Oct. 3, 1983, Ser. No. 538,690
Term of patent 14 years
U.S. Cl. D9—367

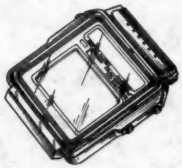
283,011
CAN
Thomas E. Moloney, Wheaton; Nelson N. Chernikoff, Richton Park; Edward S. Traczyk, Lockport; Michael M. Shulski, Northfield; Edward K. Cassidy, Palatine, and John M. Mann, Downers Grove, all of Ill., assignors to Anheuser-Busch Companies, Inc., St. Louis, Mo.
Filed Aug. 15, 1983, Ser. No. 523,514
Term of patent 14 years
U.S. Cl. D9—398

283,012
UTILITY TRAY
Austin L. Jankens, 431 Stadium Dr., Findlay, Ohio 45840
Filed Nov. 3, 1983, Ser. No. 548,310
Term of patent 14 years
U.S. Cl. D9—456



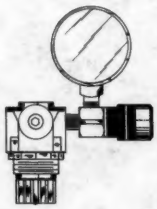
283,013
WRIST WATCH
Hayao Kano, Niiza, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 21, 1983, Ser. No. 544,459
Term of patent 14 years
U.S. Cl. D10—32

283,014
WATCH
Susumu Suzuki; Noritaka Uchihori, and Naoto Fukasawa, all of Suwa, Japan, assignors to Kabushi Kaisha Suwa Seikosha, Tokyo, Japan
Filed Jul. 22, 1983, Ser. No. 516,417
Claims priority, application Japan, Jan. 22, 1983, 58-2179
Term of patent 14 years
U.S. Cl. D10—38

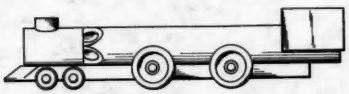


283,015
WATCH CASE
Marc Lederrey, Le Landeron, Switzerland, assignor to Rado Uhren AG, Lengnau, Switzerland
Division of Ser. No. 378,489, May 17, 1982, Pat. No. Des. 277,830. This application Jan. 14, 1985, Ser. No. 691,175
Term of patent 14 years
U.S. Cl. D10—39

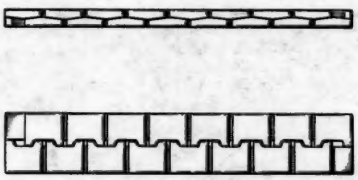
283,016
QUICK CONNECTING CYLINDER AIR LEAKAGE TESTER
Edward Evenson, Chicago, Ill., assignor to Milton Industries, Inc., Chicago, Ill.
Filed Jul. 25, 1983, Ser. No. 516,738
Term of patent 14 years
U.S. Cl. D10—85



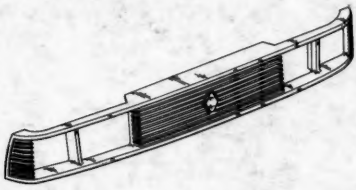
283,017
SIMULATIVE TOY WHISTLE
Glenn F. Henry, 3131 W. Jefferson St., Joilet, Ill. 60435
Filed Jan. 9, 1984, Ser. No. 569,414
Term of patent 14 years
U.S. Cl. D10—119



283,018
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Jun. 10, 1983, Ser. No. 503,348
Claims priority, application Japan, Sep. 17, 1982, 57-42307
The portion of the term of this patent subsequent to Dec. 31, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—12

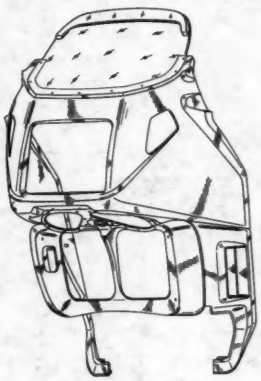


283,019
AUTOMOBILE GRILLE
Richard A. Teague, Franklin; Robert C. Nixon, and George M. Krispinsky, both of Huntington Woods, all of Mich., assignors to American Motors Corporation, Southfield, Mich.
Continuation of Ser. No. 432,152, Sep. 30, 1982, abandoned. This application Jun. 17, 1985, Ser. No. 745,815
Term of patent 14 years
U.S. Cl. D12—163

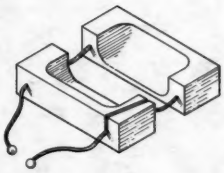


283,020
SPOILER
Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Sport-Service-Lorinser Sportliche Autoausruestung GmbH, Waiblingen, Fed. Rep. of Germany
Filed Dec. 5, 1983, Ser. No. 558,154
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 947
Term of patent 14 years
U.S. Cl. D12—181

283,021
FAIRING FOR MOTORCYCLES
Karl H. Abe, Steinebach/Woerthsee, and Klaus V. Gevert, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Nov. 9, 1983, Ser. No. 550,100
Claims priority, application Fed. Rep. of Germany, May 9, 1983, MR 13415
Term of patent 14 years
U.S. Cl. D12—182



283,022
WHEEL CHOCK
John A. Cameron, 375 Baron Ct., Erie, Colo. 80516
Filed Sep. 12, 1983, Ser. No. 531,211
Term of patent 14 years
U.S. Cl. D12—217



283,023

TELEPHONE BRANCH EXCHANGE CABINET

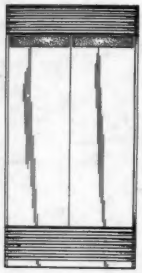
J. Scott Gibson, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Nov. 1, 1983, Ser. No. 547,440

Claims priority, application Canada, May 3, 1983, 03-05-83-2

Term of patent 14 years

U.S. Cl. D14—52



283,024

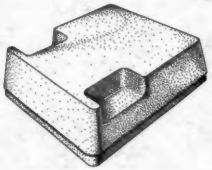
TELEPHONE STAND

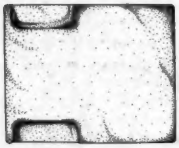
John N. McGarvey, Drexel, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Technologies, Inc., Indianapolis, Ind.

Filed Mar. 25, 1985, Ser. No. 715,702

Term of patent 14 years

U.S. Cl. D14—60





283,025

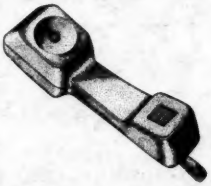
TELEPHONE HANDSET

Gary R. Gaus, Indianapolis, Ind.; John N. McGarvey, Drexel Hill, Pa.; John P. Reeves, Indianapolis, Ind., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Information Systems, Inc., Indianapolis, Ind.

Filed Sep. 20, 1985, Ser. No. 778,039

Term of patent 14 years

U.S. Cl. D14—63



283,026

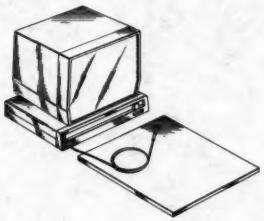
COMPUTER TERMINAL

Dana M. Richmond, Southborough, Mass., assignor to Pencept, Inc., Waltham, Mass.

Filed Aug. 1, 1983, Ser. No. 519,141

Term of patent 14 years

U.S. Cl. D14—106



283,027

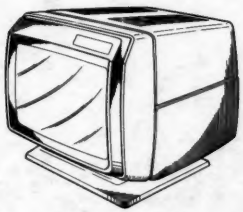
VIDEO DISPLAY TERMINAL OR SIMILAR ARTICLE

Can I. Gundogan, Boston, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed May 23, 1983, Ser. No. 496,790

Term of patent 14 years

U.S. Cl. D14—113



283,028

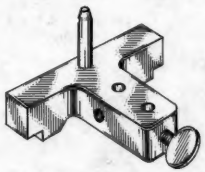
FLUID INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Donald E. Goorhouse, 7125 2nd St., #111, Scottsdale, Ariz. 85251

Filed Dec. 19, 1984, Ser. No. 683,601

Term of patent 14 years

U.S. Cl. D15—5



283,029

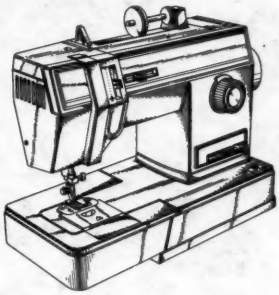
SEWING MACHINE OR SIMILAR ARTICLE

Thomas W. David, Brooklyn, N.Y., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 514,721

Term of patent 14 years

U.S. Cl. D15—69



283,030

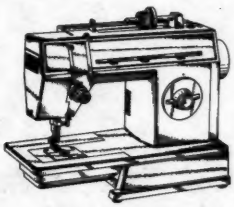
SEWING MACHINE OR SIMILAR ARTICLE

Thomas W. David, Brooklyn, N.Y., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 514,720

Term of patent 14 years

U.S. Cl. D15—69



283,031

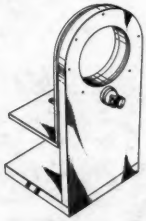
CAMERA SUPPORT BRACKET

Ehsan Sadre-Marandi, Chattanooga, and Harry L. O. Smith, Cleveland, both of Tenn., assignors to Beattie Systems, Inc., Cleveland, Tenn.

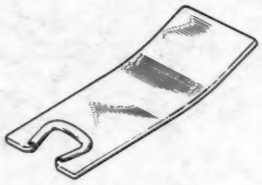
Filed Oct. 7, 1983, Ser. No. 539,791

Term of patent 14 years

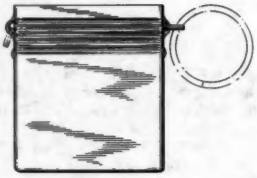
U.S. Cl. D16—44

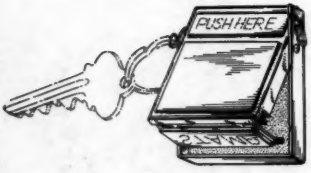


283,032
GUITAR HOLDER
Ronald N. Quesnel, 967 Cadillac St., Windsor, Ontario, Canada N8Y 2T3
Filed Sep. 23, 1983, Ser. No. 535,446
Claims priority, application Canada, Mar. 30, 1983, 30-03-83-8
Term of patent 14 years
U.S. Cl. D17—20

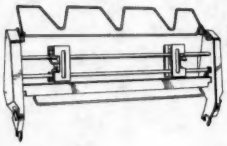


283,033
COLLAPSIBLE STAMP PAD AND KEY FOB
Peter H. Berg, 1336 Holiday Park Dr., Wantagh, N.Y. 11793
Filed Jan. 20, 1983, Ser. No. 459,426
Term of patent 14 years
U.S. Cl. D18—15

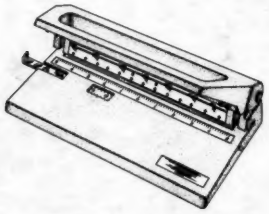




283,034
SHEET FEEDER FOR PRINTER
Masanori Hashimoto, Hills Terao 2-308 4-24 Nishiterao, Kanagawa-ku, Yokohama-shi, Kanagawa, Japan
Filed Dec. 22, 1982, Ser. No. 452,312
Claims priority, application Japan, Jun. 22, 1982, 57-027865
Term of patent 14 years
U.S. Cl. D18—22



283,035
HEAVY DUTY PAPER PUNCH
Albrecht Goertz, New York, N.Y., assignor to Rolodex Corporation, Secaucus, N.J.
Filed Jan. 10, 1983, Ser. No. 456,864
Term of patent 14 years
U.S. Cl. D19—72



283,036
KEY PURPOSE IDENTIFIER
Murray Strongwater, 326 Hewlett Neck Rd., Woodmere, N.Y. 11598
Filed Aug. 25, 1983, Ser. No. 526,478
Term of patent 14 years
U.S. Cl. D20—28

283,037
TOY WINGED HORSE FIGURE
Elizabeth Knight, Milton, Mass., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Nov. 7, 1983, Ser. No. 549,906
Term of patent 14 years
U.S. Cl. D21—165

283,038
TOY UNICORN
Elizabeth Knight, Milton, Mass., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Nov. 7, 1983, Ser. No. 549,904
Term of patent 14 years
U.S. Cl. D21—165

283,039
GOLF PUTTER HEAD
Karsten Solheim, 501 W. Wakonda La., Phoenix, Ariz. 85023
Filed Oct. 20, 1983, Ser. No. 543,824
Term of patent 14 years
U.S. Cl. D21—219

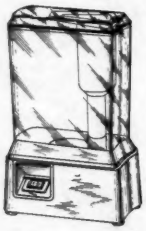
283,040
PISTOL
Darrel E. Holland, and William P. Holland, both of P.O. Box 348, Powers, Oreg. 97466
Filed Sep. 26, 1983, Ser. No. 535,919
Term of patent 14 years
U.S. Cl. D22—1

283,041
KNIFE
Alan Y. T. Lee, 24 Ferncliff Rd., Cos Cob, Conn. 06807
Filed Feb. 17, 1984, Ser. No. 581,277
Term of patent 14 years
U.S. Cl. D22—1

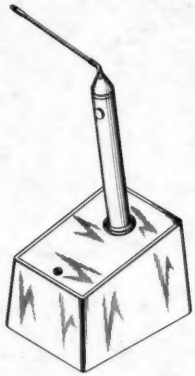
283,042
SHORT RIFLE
Darrell E. Holland, and William P. Holland, both of P.O. Box 348, Powers, Oreg. 97466
Filed Sep. 26, 1983, Ser. No. 535,768
Term of patent 14 years
U.S. Cl. D22—6

283,043
PISTOL HOLSTER
Larry E. Pitts, P.O. Box 75065, Birmingham, Ala. 35253
Filed Apr. 21, 1983, Ser. No. 487,006
Term of patent 14 years
U.S. Cl. D22—13

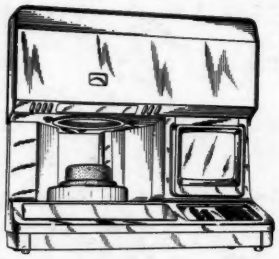
283,044
WATER PURIFIER
Alister Jack, Grijpskerk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 22, 1983, Ser. No. 534,920
Claims priority, application Benelux, Mar. 25, 1983, 57709-00
Term of patent 14 years
U.S. Cl. D23—3



283,045
THERMAL MYRINGOTOMY SYSTEM
John K. Lynn, Jacksonville, Fla., assignor to Xomed Inc., Jacksonville, Fla.
Filed Apr. 7, 1983, Ser. No. 483,065
Term of patent 14 years
U.S. Cl. D24—8



283,046
DENTAL FURNACE
Michael J. Botich, San Jacinto, Calif., assignor to Unitek Corporation, Monrovia, Calif.
Filed Apr. 22, 1983, Ser. No. 487,539
Term of patent 14 years
U.S. Cl. D24—8



283,047

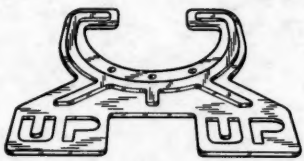
TRAY FOR BITE REGISTRATION

Anders Eriksson, Skanninge, Sweden, assignor to Anders Eriksson HB, Skanninge, Sweden

Filed Jun. 28, 1983, Ser. No. 508,682

Term of patent 14 years

U.S. Cl. D24—10



283,048

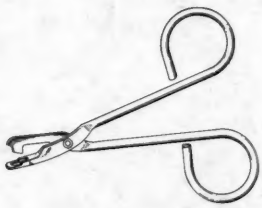
SURGICAL STAPLE REMOVER

Edward J. Sharkany, Huntington, Conn., assignor to Acme United Corporation, Fairfield, Conn.

Filed Jun. 20, 1983, Ser. No. 505,743

Term of patent 14 years

U.S. Cl. D24—26



283,049

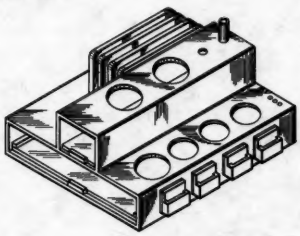
ORGANIZER FOR HOLDING DRUG DETECTION KIT ARTICLES OR THE LIKE

Mahendra K. Pandya, 8018 Daytona Ave., N.W., Massillon, Ohio 44646

Filed Nov. 18, 1983, Ser. No. 553,166

Term of patent 14 years

U.S. Cl. D24—31



283,050

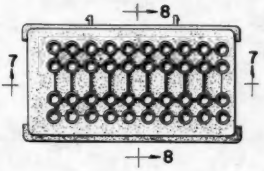
MICROBIOLOGICAL TEST TRAY

James H. Godsey, Huntington Station, N.Y., assignor to American Home Products Corporation (Del.), New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,376

Term of patent 14 years

U.S. Cl. D24—31



283,051

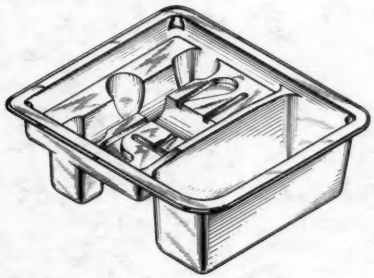
SINUS IRRIGATION TRAY

Alfred J. Fichera, Jacksonville, Fla., assignor to Xomed, Jacksonville, Fla.

Filed Jun. 20, 1983, Ser. No. 505,679

Term of patent 14 years

U.S. Cl. D24—31



283,052

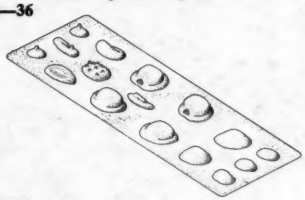
FOOT PEDAL MASSAGER

F. Josef Eugster, Taitung, Taiwan, assignor to C. S. Industrial International, Inc., Taipei, Taiwan

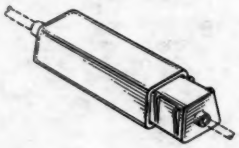
Filed Jul. 15, 1982, Ser. No. 398,571

Term of patent 14 years

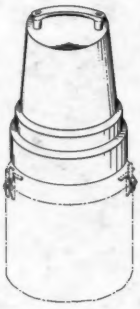
U.S. Cl. D24—36



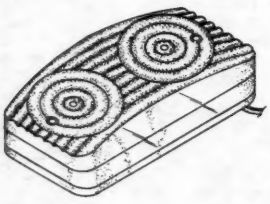
283,053
CONNECTOR FOR INVASIVE CATHETER SYSTEM
Robert A. Hermann, San Diego, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.
Filed Jun. 1, 1983, Ser. No. 500,034
Term of patent 14 years
U.S. Cl. D24—53



283,054
ROTATABLE DETACHABLE HEAD FOR WEATHER RESISTANT SPOT LIGHT
Charles W. C. Altman, Yonkers, N.Y., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.
Filed Mar. 18, 1983, Ser. No. 476,535
Term of patent 14 years
U.S. Cl. D26—24

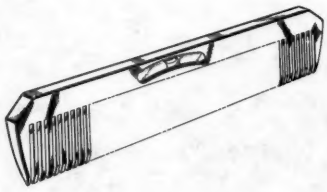


283,055
VEHICLE LAMP
David P. Meyer, 16732 Kehrsgrove Dr., St. Louis County, Mo. 63017
Filed Jun. 23, 1983, Ser. No. 507,026
Term of patent 14 years
U.S. Cl. D26—28



283,056
LAMP
Henricus J. Ansems, Spoorwegstraat 14, 6828 AS Arnhem, Netherlands
Filed Apr. 19, 1983, Ser. No. 486,497
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, DMA/000157
Term of patent 14 years
U.S. Cl. D26—61

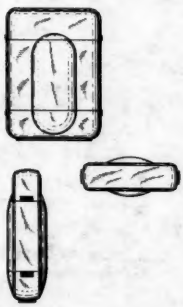
283,057
BARBER'S COMB
Christopher M. Rogers, 2020 Second Ave. South, Apt. #2, Minneapolis, Minn. 55404
Filed Jul. 5, 1984, Ser. No. 627,814
Term of patent 14 years
U.S. Cl. D28—25



283,058
ELECTRIC SHAVER
Teizo Satoh, and Masaru Miyazaki, both of Tokyo, Japan
Filed Mar. 1, 1984, Ser. No. 585,316
Term of patent 14 years
U.S. Cl. D28—50

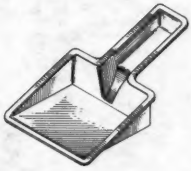
283,059
DRY SHAVER
Teizoh Satoh, and Masaru Miyazaki, both of Tokyo, Japan, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 2, 1984, Ser. No. 638,599
Claims priority, application United Kingdom, Feb. 6, 1984, 1.017.742
Term of patent 14 years
U.S. Cl. D28—50

283,060
ELECTRIC DRY SHAVER WITH COVER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 23, 1984, Ser. No. 633,545
Term of patent 14 years
U.S. Cl. D28—51

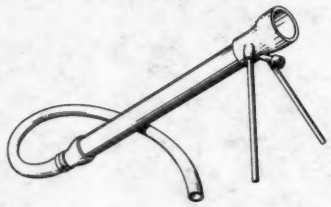


283,061
ELECTRIC HAIR CLIPPER
Tadashi Kitashima, Hino; Masaru Komiya, Kodaira, and Toshirou Higa, Hino, all of Japan, assignors to Kyusyu Hitachi Maxell, Ltd., Fukoka, Japan
Filed Jul. 17, 1984, Ser. No. 631,823
Claims priority, application Japan, Jan. 18, 1984, 59-1542
Term of patent 14 years
U.S. Cl. D28—53

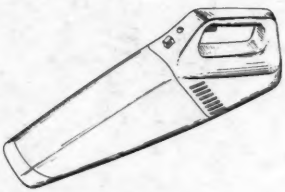
283,062
DISPOSABLE SCOOP
Peter F. Lordi, Highland, N.Y., assignor to Ulster Manufacturing, Inc., Highland, N.Y.
Division of Ser. No. 475,023, Mar. 14, 1983. This application Apr. 29, 1985, Ser. No. 728,521
Term of patent 14 years
U.S. Cl. D30—99



283,063
WASHING UNIT FOR CYLINDRICAL CARTRIDGE FILTERS
Paul D. Holman, 919 E. Kaler Dr., Phoenix, Ariz. 85020
Filed Jan. 31, 1983, Ser. No. 462,649
Term of patent 14 years
U.S. Cl. D32—1

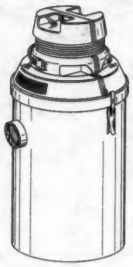


283,064
HAND-HELD VACUUM CLEANER
Joyce K. Thomas, and Samuel E. Hohulin, both of Lexington, Ill., assignors to National Union Electric Corporation, Bloomington, Ill.
Filed Mar. 16, 1983, Ser. No. 475,756
Term of patent 14 years
U.S. Cl. D32—18

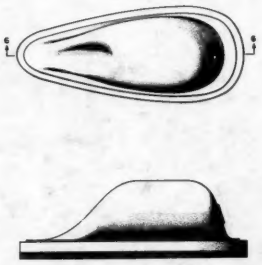


283,065
TOP PORTION FOR A CANISTER-TYPE SUCTION APPARATUS
Siegfried Maier, Stetten, Fed. Rep. of Germany, assignor to DÜPRO AG, Romanshorn, Switzerland
Filed Sep. 22, 1983, Ser. No. 534,551
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, MR 20 745
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—23

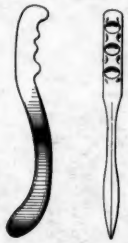
283,066
TOP PORTION FOR A CANISTER-TYPE SUCTION APPARATUS
Siegfried Maier, Stetten, Fed. Rep. of Germany, assignor to DÜPRO AG, Romanshorn, Switzerland
Filed Sep. 22, 1983, Ser. No. 534,552
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, MR 20 745
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—23



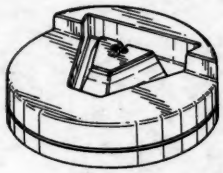
283,067
DISPENSING APPLICATOR
Kenneth G. McLin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 26, 1983, Ser. No. 498,239
Term of patent 14 years
U.S. Cl. D32—45



283,068
STRIGIL
Albert R. Beal, 95 W. Hampton Rd., Philadelphia, Pa. 19118
Filed Nov. 25, 1983, Ser. No. 555,056
Term of patent 14 years
U.S. Cl. D32—49



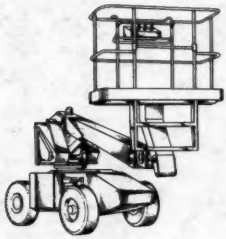
283,069
IRON BASE
William C. Dobson, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 17, 1984, Ser. No. 581,491
Term of patent 14 years
U.S. Cl. D32—73



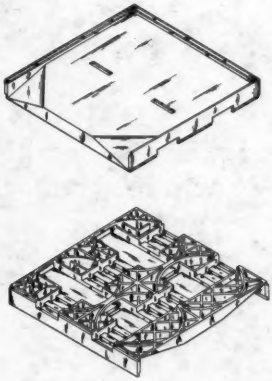
283,070
GOLF CART
Henry P. Yokers, Menomonee Falls, and Janet M. Conley, Milwaukee, both of Wis., assignors to ABC Industries, Inc., Milwaukee, Wis.
Filed May 16, 1983, Ser. No. 494,949
Term of patent 14 years
U.S. Cl. D34—15

283,071
UTILITY CART
Stanley J. Neuhaus, R.R. 1, Shell Rock, Iowa 50670
Filed Sep. 6, 1983, Ser. No. 529,262
Term of patent 14 years
U.S. Cl. D34—24

283,072
SELF-PROPELLED AERIAL WORK PLATFORM
Azam S. Qureshi, Fullerton, and William D. Murrill, Downey, both of Calif., assignors to Calavar Corporation, Santa Fe Springs, Calif.
Filed Jun. 16, 1983, Ser. No. 505,361
Term of patent 14 years
U.S. Cl. D34—34



283,073
PALLET
John J. Marshall, West Chester, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed May 23, 1983, Ser. No. 497,030
Term of patent 14 years
U.S. Cl. D34—38



283,074

SHELF BIN

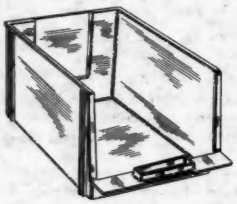
Hans Skillius, Halmstad, Sweden, assignor to A/S E. Damberg Group, Nykobing Falster, Denmark

Filed Feb. 15, 1983, Ser. No. 466,544

Claims priority, application Denmark, Aug. 31, 1982, 823/1982

Term of patent 14 years

U.S. Cl. D34—40



283,075

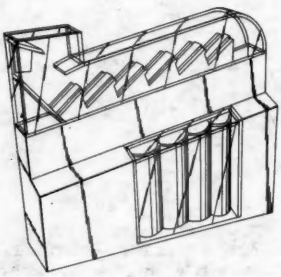
COIN BANK OR SIMILAR ARTICLE

John W. Spirk, Jr., 50 Stonewood Dr., and John R. Nottingham, 60 Stonewood Dr., both of Moreland Hills, Ohio 44022

Filed May 17, 1985, Ser. No. 735,317

Term of patent 14 years

U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GmbH: *See*—
Bauer, Kurt H.; Ghyczy, Miklos; Etschenberg, Eugen; and Osthoff, Heinrich, 4,576,626, Cl. 71-28.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Garber, Gary L.; and Allhands, Marcus N., 4,576,117, Cl. 119-52.00B.

A. W. Chesterton Company: *See*—
Azibert, Henri V., 4,576,384, Cl. 277-81.00S.

Aab, Hans-Walter: *See*—
Lehmann, Wolfgang; and Aab, Hans-Walter, 4,576,420, Cl. 308-6.00C.

Aas, Flemming; and Jeppesen, Borge, to Radiometer A/S. Method and a closure cap for sealing a capillary tube. 4,576,595, Cl. 604-256.000.

Abbondanti, Alberto, to Westinghouse Electric Corp. Apparatus for efficient use of a microprocessor to control thyristors. 4,577,269, Cl. 363-129.000.

Abbott Laboratories: *See*—
Levin, Harold A.; and Larkin, Mark E., 4,576,602, Cl. 604-408.000.

Abdite Industries, Inc.: *See*—
Laszlo, Oliver J., 4,575,911, Cl. 29-156.80B.

Abe, Shinya: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.

Abe, Tomoaki: *See*—
Muto, Yukio; Kinugawa, Masumi; and Abe, Tomoaki, 4,576,039, Cl. 73-118.000.

Abel, Irving R.; and Hatch, Marcus R., to Honeywell Inc. Reflective Schmidt system with nonrotationally symmetric corrector. 4,576,452, Cl. 350-620.000.

Abo, Keiju: *See*—
Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,576,265, Cl. 192-0.055.

Abramov, Igor. Fingerprint sensor. 4,577,345, Cl. 382-4.000.

AccuRay Corporation: *See*—
Sturm, Steven P., 4,577,104, Cl. 250-339.000.

Acevedo, Efrain: *See*—
Tarancon, Gregorio; Acevedo, Efrain; and Saud, Abel, 4,576,837, Cl. 427-255.400.

Achard, Serge: *See*—
Fontaine, Guy; and Achard, Serge, 4,577,183, Cl. 340-541.000.

Adachi, Osao; and Ameyama, Minoru, to Boehringer Mannheim GmbH. NAD(P)-Independent glycerol dehydrogenase, a process for the preparation thereof and the use thereof for the determination of glycerol and triglycerides. 4,576,913, Cl. 435-26.000.

Adair, Paul C.; and Burkholder, Amy L., to Mead Corporation, The. Photosensitive microcapsules useful in polychromatic imaging having radiation absorber. 4,576,891, Cl. 430-138.000.

Adams, Don L.; Evans, Charles W.; and Wright, Stuart C., to United Technologies Corporation. Flight director go-around mode. 4,577,275, Cl. 364-433.000.

Adams, James; and Belin, Felix, to Republic Steel Corporation. Automatic combustion control apparatus and method. 4,576,570, Cl. 431-12.000.

Adduci, Robert L.: *See*—
Spisak, Andrew M.; and Adduci, Robert L., 4,576,258, Cl. 188-299.000.

Adolfsson, Morgan; Brogardh, Iorgny; and Ovren, Christer, to ASEA Aktiebolag. Circuits with electro-optical feedback for display and a digitizer application. 4,577,189, Cl. 340-794.000.

Adolphi, Heinrich: *See*—
Schwarz, Gerd-Ulrich; and Adolphi, Heinrich, 4,576,935, Cl. 514-113.000.

Advanced Micro Devices, Inc.: *See*—
Allen, Michael, 4,577,125, Cl. 307-455.000.
Brown, George W.; and Thai, Phi, 4,577,294, Cl. 365-200.000.
Wong, Thomas S. W., 4,577,296, Cl. 365-226.000.

Ae, Osamu: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.

AGB Research PLC: *See*—
Laxton, Raymond; and Smith, Peter E., 4,577,220, Cl. 358-84.000.

Agfa Gevaert Aktiengesellschaft: *See*—
Kampfer, Helmut; Langen, Hans; and Ranz, Erwin, 4,576,907, Cl. 430-507.000.

AGFA-Gevaert N.V.: *See*—
Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., 4,576,889, Cl. 430-126.000.

Ahlers, Klaas: *See*—
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,576,979, Cl. 523-404.000.

Aigner, Heinrich: *See*—
Norden, Jurgen; Aigner, Heinrich; Schindler, Fritz; and Samblebe, Reinhard, 4,576,625, Cl. 71-3.000.

Aihara, Yoshihiko: *See*—
Fukuda, Tsuyoshi; and Aihara, Yoshihiko, 4,576,457, Cl. 354-173.110.

Aikawa, Eiichi: *See*—
Matsuura, Masahiro; and Aikawa, Eiichi, 4,576,251, Cl. 182-152.000.

Aires, Ramon H.: *See*—
Easter, Finis C.; and Aires, Ramon H., 4,577,268, Cl. 363-21.000.

Aisen Seiki Kabushika Kaisha: *See*—
Hattori, Takemi, 4,576,410, Cl. 297-284.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.
Terada, Takami, 4,576,412, Cl. 297-362.000.

AIWA Co., Ltd.: *See*—
Sougen, Katsuya, 4,577,239, Cl. 360-15.000.

Ajay Enterprises Corp.: *See*—
Ogden, Ralph, 4,576,352, Cl. 248-188.400.

Ajinomoto Co., Inc.: *See*—
Matsushita, Noritaka, 4,576,647, Cl. 106-193.00R.

Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Materials for packaging light-sensitive materials. 4,576,865, Cl. 428-335.000.

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Akita, Kenji; Sakaguchi, Minoru; and Suzuyama, Hiroshi, to Hitachi, Ltd. Earthing switch for gas-insulated switchgear apparatus. 4,577,075, Cl. 200-148.00R.

Akita, Tadashi: *See*—
Fujita, Takayuki; Kitazawa, Yoshikazu; Akita, Tadashi; and Tani, Isamu, 4,577,032, Cl. 548-341.000.

Akiyama, Toshiyuki: *See*—
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; and Takemoto, Iwao, 4,577,230, Cl. 358-212.000.

Aktiebolaget Electrolux: *See*—
Martensson, Karl I. M., 4,576,792, Cl. 422-27.000.

Akzo N.V.: *See*—
Lowke, George E.; and Meltzer, Robert J., 4,576,916, Cl. 435-289.000.

Aladdin Engineering & Mfg. Co.: *See*—
Horn, Edward R.; and Kot, Norbert J., II, 4,576,367, Cl. 269-32.000.

Alaerts, Leo B.: *See*—
Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., 4,576,889, Cl. 430-126.000.

Alazet, Jean, to Cardus, Francis, a part interest. Depilating appliance. 4,575,902, Cl. 19-2.000.

Alber, Friedrich: *See*—
Markert, Helmut; Rogler, Wolfgang; Bendel, Wolfgang; and Alber, Friedrich, 4,576,768, Cl. 264-27.000.

Albrecht, Ernst; and Busch, Edgar, to Pfaff Industriemaschinen GmbH. Feed drive for a stitch group sewing machine. 4,576,103, Cl. 112-73.000.

Alcan International Limited: *See*—
Deutschman, John E., 4,576,651, Cl. 134-25.100.

Alex Moulton Limited: *See*—
Moulton, Alexander E.; and Uncles, Philip B., 4,576,393, Cl. 280-276.000.

Alexis, Roger P. J.: *See*—
Barazeche, Bahman; Alexis, Roger P. J.; and Guidoux, Loic B. Y., 4,577,309, Cl. 370-32.000.

Alfenaar, Marinus, to Electrochemische Energieconversie N.V. Fuel cell. 4,576,877, Cl. 429-12.000.

Alkhazov, Tofik G. O.; Korotaev, Jury P.; and Vartanov, Albert A., to Azerbaidzhansky Institut Nefti I Khimii Imeni Azizbekova. Catalyst for purifying gases from hydrogen sulphide. 4,576,925, Cl. 502-307.000.

Alkor GmbH Kunststoffe: *See*—
Fink, Roland; Mayr, Maximilian; and Schlenz, Dieter, 4,576,860, Cl. 428-314.400.

All-Pak, Inc.: *See—*
Willett, Richard A.; Faletti, Fred J.; and Faletti, Paul A., 4,575,986, Cl. 53-118.000.

Allard, Kenneth L.: *See—*
Weiner, Harvey I.; and Allard, Kenneth L., 4,576,547, Cl. 415-116.000.

Allegheny Ludlum Steel Corporation: *See—*
Kedzior, Edward S., 4,576,300, Cl. 217-13.000.

Allen, Ioan R., to Dolby Laboratories Licensing Corporation. Apparatus for reproducing motion picture film photographic sound-tracks to correct reproduction errors and reduce noise. 4,577,302, Cl. 369-46.000.

Allen, Ioan R.; and Todd, Craig C., to Dolby Laboratories Licensing Corporation. Stereophonic motion picture photographic sound-tracks compatible with different sound projection formats and record and playback apparatus therefore. 4,577,305, Cl. 369-86.000.

Allen, Louis B., Jr.: *See—*
Meltz, Gerald; Allen, Louis B., Jr.; and Ferrar, Carl M., 4,577,100, Cl. 250-231.00P.

Allen, Michael, to Advanced Micro Devices, Inc. Output voltage driver with transient active pull-down. 4,577,125, Cl. 307-455.000.

Allen, Richard S.: *See—*
Huang, Wann-Sheng; Mims, Donald S.; and Allen, Richard S., 4,576,036, Cl. 73-29.000.

Allen, Spencer W.: *See—*
Jones, Donald H.; and Allen, Spencer W., 4,577,271, Cl. 364-174.000.

Allhands, Marcus N.: *See—*
Garber, Gary L.; and Allhands, Marcus N., 4,576,117, Cl. 119-52.00B.

Allied Corporation: *See—*
Bach, Lloyd G., 4,576,004, Cl. 60-547.100.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,576,873, Cl. 428-606.000.
Maurice, Walter F., 4,576,325, Cl. 228-135.000.
Ohta, Yukitake; and Fukunaga, Yasuo, 4,576,437, Cl. 350-96.200.
Ray, Ranjan, 4,576,653, Cl. 148-3.000.

Allis-Chalmers Corporation: *See—*
Wooldridge, James E.; Osborne, Robert E.; and Sexton, Robert W., 4,576,618, Cl. 55-122.000.

Allred, Von D.; and Harmon, Don B. Riser repair assembly for underground irrigation systems. 4,576,400, Cl. 285-5.000.

Almo-Mobelwerke GmbH & Co. KG: *See—*
Graf, Erhard, 4,576,355, Cl. 248-544.000.

Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, to Farmitalia Carlo Erba S.p.A. Process for the preparation of penem derivatives. 4,577,016, Cl. 544-182.000.

Alpern, Alan N.: *See—*
Lewis, Kenneth A.; and Alpern, Alan N., 4,577,333, Cl. 375-45.000.

Alps Electric Company, Ltd.: *See—*
Hibino, Ikuo; and Miyajima, Mikio, 4,577,198, Cl. 346-76.0PH.
Mishio, Hiroshi, 4,576,491, Cl. 400-124.000.
Ono, Yasuichi, 4,576,985, Cl. 524-407.000.
Shimaoka, Motohiro; and Saito, Yukio, 4,577,247, Cl. 360-97.000.
Sugawara, Fukuo; Iwane, Yasuhiko; Hori, Fumihisa; and Onozato, Takashi, 4,576,492, Cl. 400-146.000.

Also Laboratori S.A.S.: *See—*
Sorbini, Paolo, 4,576,932, Cl. 514-54.000.

Alsop, Brian H.; Popa, Frank D.; and Edwards, William E., to Westinghouse Electric Corp. Burnable absorber assembly. 4,576,787, Cl. 376-447.000.

Alsthom-Atlantique: *See—*
Combes, Gilles; and Delage, Germain, 4,576,512, Cl. 405-100.000.
Pham, Van Doan, 4,577,074, Cl. 200-148.00A.

Aluminum Company of America: *See—*
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,576,767, Cl. 264-12.000.
Fields, James R.; Rogers, Elmer H., Jr; and King, Larry K., 4,576,690, Cl. 204-67.000.

ALZA Corporation: *See—*
Guittard, George V.; Deters, Joseph C.; Theeuwes, Felix; and Cortese, Richard, 4,576,604, Cl. 604-890.000.

Amariti, Luigi; and Santos, Llandro C., to Imperial Metal & Chemical Company. Method for enhancing apparent photospeed of diazonium plates by using thiocyanate to insolubilize diazonium compound after photolysis. 4,576,899, Cl. 430-309.000.

Amato, James: *See—*
Kapian, Alan; and Amato, James, 4,576,114, Cl. 118-720.000.

AMCA International Corporation: *See—*
Zanin, Michael A., 4,576,100, Cl. 105-49.000.

Amdahl Corporation: *See—*
Chiang, Ping-Wang, 4,576,900, Cl. 430-313.000.

American Cyanamid Company: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,577,018, Cl. 544-225.000.
Marsico, Joseph W., Jr.; Wright, William B., Jr.; and Press, Jeffery B., 4,576,957, Cl. 514-383.000.
Montgomery, John R.; Brumaghim, Milton W.; and Deniega, Jose C., 4,576,166, Cl. 128-325.000.
Tomcufcik, Andrew S.; Meyer, Walter E.; Dusza, John P.; and Tseng, Shin S., 4,576,943, Cl. 514-222.000.

American Television & Communications Corporation: *See—*
Skinner, Russell A., Sr.; and Ciciora, Walter S., 4,577,221, Cl. 358-86.000.

Ameyama, Minoru: *See—*
Adachi, Osao; and Ameyama, Minoru, 4,576,913, Cl. 435-26.000.

Amici, Francis R.; Berger, Hans S.; Farrington, Richard I.; and Piazza, Pietro, to Coleco Industries, Inc. Cord-climbing creature. 4,576,586, Cl. 446-315.000.

Ammann, Heinz, to Sulzer Brothers Limited. Heat exchanger. 4,576,120, Cl. 122-6.00A.

AMP Incorporated: *See—*
Joos, Manfred; and Maack, Werner, 4,575,932, Cl. 29-751.000.
Maack, Werner; Kampfmann, Georg; and Foerster, Peter, 4,576,032, Cl. 72-431.000.

Amrany, Daniel: *See—*
Eitan, Boaz; Kolodny, Avi; Amrany, Daniel; and McCreary, James, 4,577,295, Cl. 365-218.000.

Anahara, Meiji; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Pneumatic nozzle utilized in the process of producing a fasciated yarn. 4,575,999, Cl. 57-333.000.

Anami, Masahiko: *See—*
Oyachi, Tomio; Fukuda, Hiroya; and Anami, Masahiko, 4,576,859, Cl. 428-311.100.

Anatros Corporation: *See—*
Danby, Hal C., 4,576,592, Cl. 604-80.000.

Ancheta, Antonio D. Two-stroke internal combustion engine. 4,576,126, Cl. 123-41.380.

Andersen, Frieda, to Saint Margaret Hospital. Construction for alerting health-care professionals. 4,577,185, Cl. 340-573.000.

Anderson, Charles H.: *See—*
Liu, Richard T.; Nickerson, Winston R.; and Anderson, Charles H., 4,576,826, Cl. 426-289.000.

Anderson, David N., to FMC Corporation. Apparatus for producing frozen confections. 4,576,562, Cl. 425-126.00S.

Anderson, Marlow C., to Boeing Commercial Airplane Company. Flow forming of composite material. 4,576,776, Cl. 264-510.000.

Anderson, Wayne A.: *See—*
Ehrlich, Paul; Anderson, Wayne A.; Kang, En T.; and Bhatt, Ansuya P., 4,576,887, Cl. 430-71.000.

Andersson, Bengt, to Waco Jonserreds AB. Device in a machine tool for maintaining a workpiece displaced in its longitudinal direction, in engagement with the tool. 4,576,212, Cl. 144-243.000.

Andersson, Bjorn H.: *See—*
Grip, Carl E.; Hagstad, Bertil J.; and Andersson, Bjorn H., 4,575,912, Cl. 29-173.000.

Ando, Haruhisa: *See—*
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.

Anglo Blackwells Limited: *See—*
Thistlethwaite, Stuart R., 4,576,791, Cl. 420-552.000.

Anitole, George, to United States of America, Army. Method for developing natural camouflage patterns. 4,576,904, Cl. 430-347.000.

Anson, Fred C.: *See—*
Collins, Terrence J.; Anson, Fred C.; Gipson, Stephen L.; and Krafft, Terry E., 4,577,042, Cl. 564-158.000.

Antonucci, Joseph M.: *See—*
Davis, George T.; Chiang, Chawan-Kang; Antonucci, Joseph M.; and Takahashi, Toru, 4,576,882, Cl. 429-192.000.

Anzai, Masafumi: *See—*
Suganuma, Nobuo; Anzai, Masafumi; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,576,816, Cl. 424-50.000.

Aoki, Katsumichi; Shida, Takafumi; Kanda, Yoichi; Satake, Keigo; Shinkawa, Hiroyasu; and Yamazaki, Shiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of tetrahydrobenzothiazole and herbicidal composition containing the same as active ingredient. 4,577,029, Cl. 548-162.000.

Aoki, Keiichi: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.

Aono, Katsutoshi: *See—*
Totani, Tetsushi; and Aono, Katsutoshi, 4,577,038, Cl. 556-137.000.

Aoyama, Akimasa: *See—*
Tanaka, Yoshinari; Aoyama, Akimasa; Moritani, Takeshi; Satoh, Kenji; and Okaya, Takuji, 4,576,988, Cl. 524-503.000.

Aoyama, Susumu: *See—*
Sugiuchi, Toshiyasu; Aoyama, Susumu; and Yoshida, Toshio, 4,575,913, Cl. 29-432.000.

Applied Power Inc.: *See—*
Janecke, James P.; and Patel, Kishor J., 4,576,200, Cl. 137-624.130.

Arai, Ikuya; Murata, Toshinori; and Kazumi, Masafumi, to Hitachi, Ltd. Transversal filter incorporating MOS-transistor amplifiers. 4,577,228, Cl. 358-167.000.

Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yashio; and Iizumi, Toyoko, to Nissan Chemical Industries, Ltd. Method of preparing α-aromatic propionic acids and intermediates thereof. 4,577,025, Cl. 546-198.000.

Arai, Masatoshi; Futatsumori, Koji; Inoue, Takeo; and Sato, Shinichi, to Shin-Etsu Chemical Co., Ltd. Cyclic organopolysiloxane compound. 4,577,041, Cl. 556-446.000.

Arakawa Kagaku Kogyo Kabushiki Kaisha: *See—*
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,576,680, Cl. 162-158.000.

Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Method and apparatus for controlling an operation of plant. 4,576,007, Cl. 60-660.000.

Araki, Hiroaki; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic metal powder. 4,576,635, Cl. 75-0.5AA.
Aretz, Ulrich; and Buhren, Heinz, to W. Schlafhorst & Co. Device for depositing and keeping the thread end in the cop tube of a spinning cop passed on from a cop preparation station to transporting means. 4,576,340, Cl. 242-35.50A.
Arieh, Simon; and Courvoisier, Guy, to Lange International S.A. Ski boot. 4,575,958, Cl. 36-121.000.
Arito, Tatsunari: *See*—
Shiga, Koji; and Arito, Tatsunari, 4,576,469, Cl. 355-29.000.
Ariyoshi, Takashi: *See*—
Emura, Noriaki; Ariyoshi, Takashi; and Kato, Toshikazu, 4,577,004, Cl. 526-204.000.
Arkles, Barry C.; and Hamon, Burrell N., to Petrarch Systems Inc. Method of preparing hexamethylcyclotrisilazane. 4,577,039, Cl. 556-409.000.
Armida, Gennaro; Sacco, Decio; and Grilli, Walter, to Italtractor I.T.M. S.p.A. Assembly-procedure and relative hinge-assembly for use with lubricated-type crawler tracks. 4,575,914, Cl. 29-434.000.
Armiger, William B.: *See*—
MacBride, William R.; Magee, James A.; Armiger, William B.; and Zabriskie, Dane W., 4,577,110, Cl. 250-461.200.
Armines: *See*—
Broussaud, Daniel; Mustel, William; and Minjolle, Louis, 4,576,923, Cl. 501-98.000.
Armington, Alton F.; and Larkin, John J., to United States of America, Air Force. Quartz growth on X-seeds. 4,576,808, Cl. 423-335.000.
Armond, John W.; and Smith, Kenneth C., to BOC Group, Inc., The. Process and apparatus for separation of a gaseous mixture. 4,576,614, Cl. 55-18.000.
Arney, Donald B. Fire fighting bucket assembly for aircraft. 4,576,237, Cl. 169-53.000.
Arnold, Emil, to North American Philips Corporation. Method of manufacturing a high resistance layer having a low temperature coefficient of resistance and semiconductor device having such high resistance layer. 4,575,923, Cl. 29-576.00B.
Arnold, Jack T.: *See*—
Webb, Robert E.; Kreeft, Eugene H.; and Arnold, Jack T., 4,577,060, Cl. 179-2.0EC.
Aro Corporation, The: *See*—
Baltz, James P.; and Plouck, Richard E., 4,576,270, Cl. 192-150.000.
Art Kinzoku Kogyo Kabushiki Kaisha: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,576,863, Cl. 428-325.000.
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Feeding device for introducing steel melt into twin-belt casters. 4,576,218, Cl. 164-431.000.
Asahi Glass Company Ltd.: *See*—
Miyazaki, Nobuyuki; Takayanagi, Takashi; and Higaki, Hiromichi, 4,576,977, Cl. 523-137.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kuroda, Toru; and Yamawaki, Naokuni, 4,576,927, Cl. 502-402.000.
Tajima, Isao, 4,576,847, Cl. 428-67.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Itoh, Takayuki, 4,576,443, Cl. 350-427.000.
Asbill, Clarence M., III: *See*—
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,576,194, Cl. 137-84.000.
ASEA Aktiebolag: *See*—
Adolfsson, Morgan; Brogardh, Iorgny; and Ovren, Christer, 4,577,189, Cl. 340-794.000.
Bergman, Kjell; and Stenkvist, Sven-Einar, 4,577,326, Cl. 373-103.000.
Ashenfelter, Roger N., to Tecumseh Products Company. Oil dispersing device. 4,576,555, Cl. 417-372.000.
Ashimori Industry Co., Ltd.: *See*—
Morinaga, Akio; Sakaguchi, Yoichi; Hyodo, Masakatsu; and Yagi, Isaburo, 4,576,205, Cl. 138-98.000.
Ashland Oil, Inc.: *See*—
Miller, Charles B.; and Whitt, Roy E., 4,576,709, Cl. 208-57.000.
AT&T Bell Laboratories: *See*—
Bimonte, Brian R.; Gauldin, Mark A.; and Riley, Douglas H., 4,577,066, Cl. 179-18.00B.
Chrin, Christopher J., 4,577,287, Cl. 364-721.000.
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., 4,577,314, Cl. 370-94.000.
Copeland, John A., 4,577,207, Cl. 357-17.000.
Dunlop, Alfred E.; and Kernighan, Brian W., 4,577,276, Cl. 364-491.000.
Forrest, Stephen R.; and Panock, Richard L., 4,577,209, Cl. 357-30.000.
Frey, Alan E.; and Kerr, Howard A., 4,577,065, Cl. 179-18.0BC.
Ho, Gary S.; and Peterson, Ralph W., 4,577,274, Cl. 364-200.000.
Kavehrad, Mohsen, 4,577,330, Cl. 375-15.000.
Kim, Suk K.; and Viswanathan, Thayamkulangara R., 4,577,119, Cl. 307-297.000.
Kohl, Paul A.; Smith, Lawrence E.; and Trop, Harvey S., 4,576,691, Cl. 204-129.300.
Larson, Mikiel L.; and Toy, Wing N., 4,577,308, Cl. 370-9.000.
Law, Hung-Fai S., 4,577,190, Cl. 340-825.830.
Logan, Ralph A.; and Tsang, Won-Tien, 4,575,919, Cl. 29-569.00L.
Meeker, Thrygve R.; and Tsay, Wei-Shin, 4,577,169, Cl. 333-194.000.
Nash, Peter D., 4,577,312, Cl. 370-84.000.
Schaper, Leonard W., 4,577,214, Cl. 357-74.000.
AT&T Information Systems Inc.: *See*—
Kelly, Thomas J.; and Tyler, Daniel W., 4,577,068, Cl. 179-100.00R.
Atkinson, Lowell G.: *See*—
Winston, Walter E.; and Atkinson, Lowell G., 4,576,553, Cl. 417-9.000.
Atlantic Richfield Company: *See*—
Brasher, John K., 4,576,107, Cl. 116-227.000.
Atwater, Harry A.: *See*—
Smith, Henry I.; Atwater, Harry A.; and Geis, Michael W., 4,576,676, Cl. 156-603.000.
Audemars, Daniel: *See*—
Muller, Niklaus; and Audemars, Daniel, 4,576,526, Cl. 406-75.000.
Auerbach, Steven L.; and Conklin, Sharon J., to Conklin, Sharon J. Helmet liner for containing water. 4,575,871, Cl. 2-6.000.
Auracher, Walter. Orthopaedic support for the head and neck. 4,576,150, Cl. 128-75.000.
Automated Packaging Systems, Inc.: *See*—
Lerner, Hershey, 4,575,901, Cl. 17-11.000.
Automatic Mechanical System Engineering Co.: *See*—
Matsumoto, Masato, 4,576,243, Cl. 177-119.000.
Automatix Incorporated: *See*—
Warren, Theodore L.; Whelan, Kenneth R.; and Reinhold, Arnold G., 4,577,344, Cl. 382-1.000.
Automobiles Citroen: *See*—
Barthelemy, Andre , 4,576,056, Cl. 74-388.0PS.
Automobiles Peugeot: *See*—
Barthelemy, Andre , 4,576,056, Cl. 74-388.0PS.
Avins, Jack, to RCA Corporation. Noise reduction for FM stereophonic systems and particularly useful in television audio systems. 4,577,226, Cl. 358-143.000.
AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik: *See*—
Krempl, Peter W.; and Schindler, Wolfgang, 4,577,105, Cl. 250-343.000.
Axelsson, Robert: *See*—
Svensson, Jan A.; and Axelsson, Robert, 4,576,199, Cl. 137-614.040.
Azerbaidzhansky Institut Nefti I Khimii Imeni Azizbekova: *See*—
Alkhazov, Tofik G. O.; Korotaev, Jury P.; and Vartanov, Albert A., 4,576,925, Cl. 502-307.000.
Azibert, Henri V., to A. W. Chesterton Company. Split mechanical face seal. 4,576,384, Cl. 277-81.00S.
Azuma, Hidekazu: *See*—
Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, 4,576,725, Cl. 252-62.510.
Azzola, Roberto; and Carrera, Luciano, to S.A.I.A.G. S.p.A. Method and apparatus for extruding weather strip for motor-vehicles. 4,576,773, Cl. 264-167.000.
Baba, Misao: *See*—
Ogawa, Yoshiyuki; Uno, Hideaki; and Baba, Misao, 4,576,368, Cl. 269-322.000.
Babcock & Wilcox Company, The: *See*—
Keyes, Marion A., IV; Lui, Peter K.; and Malcolm, Jack W., deceased, 4,577,097, Cl. 250-211.00K.
Bach, Lloyd G., to Allied Corporation. Braking device with oppositely movable diaphragms. 4,576,004, Cl. 60-547.100.
Backus, George S. Golf pronation training device. 4,576,378, Cl. 273-186.00A.
Badesha, Santokh S.; Pai, Damodar M.; Carmichael, Kathleen M.; and Tarnawskyj, Ihor W., to Xerox Corporation. Process for the preparation of chalcogenide alloys. 4,576,634, Cl. 75-0.50A.
Badger B.V.: *See*—
Cohen, Lester R., 4,576,683, Cl. 203-15.000.
Baffes, Thomas G.: *See*—
Levy, Aaron I., 4,576,155, Cl. 128-132.00R.
Bailey, Donald H., to Suburban Tool, Inc. Gage block management system. 4,577,285, Cl. 364-560.000.
Baker Oil Tools, Inc.: *See*—
Ross, Richard J.; and Speller, David J., 4,576,196, Cl. 137-508.000.
Stout, Gregg W.; Nelson, John A.; and Crisp, John H., 4,576,236, Cl. 166-386.000.
Bakulin, Valentin P.: *See*—
Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N., 4,576,824, Cl. 426-241.000.
Baldwin, Robert M.: *See*—
Oko, Uriel M.; and Baldwin, Robert M., 4,576,708, Cl. 208-11.0LE.
Ballard, Michael J. Ring seal with overlapping flanges for contaminant trapping. 4,576,383, Cl. 277-53.000.
Ballew, James D.; and Rogers, Phil H., to E-Systems, Inc. Fault tolerant and load sharing processing system. 4,577,272, Cl. 364-200.000.
Balogh, John M.; and Terzian, Rouben T., to Marvin Glass & Associates. Toy figures with vacuum changeable features. 4,576,585, Cl. 446-199.000.
Baltz, James P.; and Plouck, Richard E., to Aro Corporation, The. Torque control and fluid shutoff mechanism for a fluid operated tool. 4,576,270, Cl. 192-150.000.
Balzer, Norbert R., to Park-Ohio Industries, Inc. Heating nonmagnetic metal workpieces. 4,577,081, Cl. 219-10.690.
Bancroft, Joseph C. Extruded metal corner construction. 4,576,502, Cl. 403-231.000.
Bangor Punta Corporation: *See*—
Mikuta, Richard; and Curran, Roger, 4,575,961, Cl. 42-1.00S.
Barazeche, Bahman; Alexis, Roger P. J.; and Guidoux, Loic B. Y., to 501 Telecommunications Radioelectriques et Telephoniques T.R.T.

Method and apparatus for measuring distant echo delay in an echo cancelling arrangement. 4,577,309, Cl. 370-32.000.

Barber-Colman Company: *See—*
Haug, Edward W., 4,576,527, Cl. 407-28.000.

Barch, Daniel R.: *See—*
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,576,767, Cl. 264-12.000.

Baribeau, Jean J.: *See—*
Lam, Wim J.; Devries, Luitzen; McKinnon, Gordon M.; and Baribeau, Jean J., 4,576,577, Cl. 434-58.000.

Baril, Earl F.: *See—*
McCaffrey, Ronald; Wright, George; and Baril, Earl F., 4,576,948, Cl. 514-274.000.

Bark, Manfred: *See—*
Roseland, Hermann; and Bark, Manfred, 4,575,889, Cl. 12-15.000.

Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. Developer for positive photoresists. 4,576,903, Cl. 430-331.000.

Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., to International Business Machines Corporation. Display workstation. 4,577,187, Cl. 340-700.000.

Barr-Scarlett Trust: *See—*
Barr, William A., 4,576,261, Cl. 192-4.00A.

Barr-Truitt Trust: *See—*
Barr, William A. (William A. Barr, trustee, part interest to each assors. to), 4,576,261, Cl. 192-4.00A.

Barr, William A., to William A. Barr Memorial Trust; Barr-Scarlett Trust; and Barr-Truitt Trust, by William A. Barr, trustee, part interest to each. Safety parking brake for automatic transmissions. 4,576,261, Cl. 192-4.00A.

Barradas, George. Heatable roller for curling hair. 4,576,188, Cl. 132-39.000.

Barrett, William H.: *See—*
Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.

Barth, Gerald D.; and Wagner, David P., to Illinois Tool Works Inc. Thread form for soft material. 4,576,534, Cl. 411-412.000.

Barthelemy, Andre , to Automobiles Citroen; and Automobiles Peugeot. Rotary assistance mechanism, particularly for vehicle steering. 4,576,056, Cl. 74-388.0PS.

Barton, Roger W.; Coufal, Hans J.; Jipson, Victor B.; and Lee, Wen Y., to International Business Machines Corporation. Optical recording by energy-induced fractionation and homogenization. 4,576,895, Cl. 430-270.000.

Barzynski, Helmut: *See—*
Saenger, Dietrich; and Barzynski, Helmut, 4,576,902, Cl. 430-326.000.

BASF Aktiengesellschaft: *See—*
Eisenlauer, Josef; Horn, Dieter; and Neuwirth, Manfred, 4,576,723, Cl. 210-709.000.
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,576,804, Cl. 423-265.000.
Hoffmann, Gerhard; Kleuser, Dieter; and Lenz, Werner, 4,576,898, Cl. 430-306.000.
Parg, Adolf; Hamprecht, Gerhard; Sauter, Hubert; and Wuerzer, Bruno, 4,576,630, Cl. 71-92.000.
Ruehenbeck, Wolfgang, 4,576,573, Cl. 432-15.000.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,576,979, Cl. 523-404.000.
Schwarz, Gerd-Ulrich; and Adolphi, Heinrich, 4,576,935, Cl. 514-113.000.

BASF Farben & Fasern Aktiengesellschaft: *See—*
Poth, Ulrich; and Hille, Hans-Dieter, 4,576,868, Cl. 428-423.100.

Baskerville, Martin W.; Maltman, William R.; and Oliver, Stephen N., to Plessey Company PLC, The. Photochromic compounds and their use in photoreactive lenses. 4,576,766, Cl. 264-1.400.

Bate, Robert T.: *See—*
Reed, Mark A.; and Bate, Robert T., 4,575,924, Cl. 29-576.00E.

Bates, John F.; Brager, Howard R.; and Korenko, Michael K., to United States of America, Energy. Austenitic alloy and reactor components made thereof. 4,576,641, Cl. 75-128.00P.

Bauer, Kurt H.; Ghyczy, Miklos; Etschenberg, Eugen; and Osthoff, Heinrich, to A. Nattermann & Cie GmbH. Foliage fertilizers. 4,576,626, Cl. 71-28.000.

Bauhahn, Paul E., to Honeywell Inc. Internally matched Schottky barrier beam lead diode. 4,577,213, Cl. 357-69.000.

Baum, Fredrick W., Jr. Right angle measuring apparatus. 4,575,943, Cl. 33-138.000.

Baumgartner, Ehrenfried; Besecke, Siegmund; and Gaenzler, Wolfgang, to Rohm GmbH. Flame-retarded polyacrylamide or polymethacrylimide synthetic resin foam. 4,576,971, Cl. 521-108.000.

Baxter Travenol Laboratories, Inc.: *See—*
Combs, Cathy M.; Duffy, Joseph K.; and Thoene, Mark, 4,576,017, Cl. 62-372.000.

Bayer Aktiengesellschaft: *See—*
Buding, Hartmuth; Konigshofen, Heinrich; Szentivanyi, Zsolt; and Thormer, Joachim, 4,576,992, Cl. 525-211.000.
Ganster, Otto; Knipp, Ulrich; and Luckas, Bruno, 4,576,970, Cl. 521-51.000.
Jager, Horst; Harms, Wolfgang; and Herd, Karl J., 4,577,015, Cl. 544-76.000.
Noll, Klaus; Potter, Terry; Pedain, Josef; and Schwindt, Jurgen, 4,576,989, Cl. 524-591.000.
Reischl, Artur; and Mack, Kurt, 4,576,718, Cl. 210-616.000.
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., 4,576,771, Cl. 264-109.000.

Bayer, Helmut, to Electrovac Gesellschaft m.b.H. Temperature regulating device. 4,577,176, Cl. 337-394.000.

Bayer, Jurgen: *See—*
Humpolik, Bohumil; Kluna, Vlastimil; Winterer, Wilfried; Kuchelmeister, Reinhold; and Bayer, Jurgen, 4,576,223, Cl. 165-79.000.

Bazuin, Johannes, to Le Bland Makino Machine Tool Co. Turret lathe having probe and protective cover. 4,576,069, Cl. 82-2.00R.

BBC Brown, Boveri & Company, Limited: *See—*
Blahous, Leopold; and Koppl, Georg, 4,577,253, Cl. 361-62.000.

BBL Industries, Inc.: *See—*
Webb, Robert E.; Kreeft, Eugene H.; and Arnold, Jack T., 4,577,060, Cl. 179-2.0EC.

Beair, Charles E.: *See—*
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., 4,576,303, Cl. 220-89.00A.

Beard, James W.: *See—*
Gaylor, Lawrence A.; and Beard, James W., 4,576,722, Cl. 210-699.000.

Beaty, John E., Sr. Security gate. 4,576,509, Cl. 404-6.000.

Bechem, Werner; Peters, Hubertus; Solms, Jurgen; and Wolfhard, Dietrich, to Hoesch Aktiengesellschaft. Method for the continuous electrolytic deposition of metals. 4,576,684, Cl. 204-28.000.

Beck, Martin H.; and Krishnakumar, Suppayan M., to Continental Group, Inc., The. Blow molded containers and method of forming the same. 4,576,843, Cl. 428-35.000.

Beck, Martin H.: *See—*
Clark, Richard E.; Tacito, Louis D.; Miller, Bryan H.; and Beck, Martin H., 4,575,915, Cl. 29-509.000.

Beckmann, Gerhard: *See—*
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,576,218, Cl. 164-431.000.

Bedeschi, Angelo: *See—*
Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,577,016, Cl. 544-182.000.

Beecham Group p.l.c.: *See—*
Hurst, Jim; and May, Josephine B., 4,576,952, Cl. 514-303.000.

Beery, Jack; Donahue, Frederick A.; and Shaul, Ronald E., to Xerox Corporation. Multiple copy and transparency detector with illumination control. 4,577,096, Cl. 250-205.000.

Belanger, Inc.: *See—*
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,576,098, Cl. 104-172.00B.

Belanger, James A.; Wentworth, Robert; and Lapham, James M., to Belanger, Inc. Automobile conveyor. 4,576,098, Cl. 104-172.00B.

Beleckis, Vytautas K., to Dennison National Company. Easel type ring binder construction. 4,576,497, Cl. 402-73.000.

Belin, Felix: *See—*
Adams, James; and Belin, Felix, 4,576,570, Cl. 431-12.000.

Belko, Robert P.: *See—*
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,576,741, Cl. 252-522.00R.
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,576,742, Cl. 252-522.00R.

Bell Communications Research, Inc.: *See—*
Drewes, John H.; and Gemra, Richard J., 4,575,904, Cl. 24-115.00K.

Bell & Howell Company: *See—*
Parker, Robert R.; and DiGianfilippo, Dominic J., 4,576,578, Cl. 434-307.000.

Belz, Gerard, to Commissariat a l'Energie Atomique. Releasable anti-ejection device for the control rods of a nuclear reactor. 4,576,780, Cl. 376-235.000.

Bendel, Wolfgang: *See—*
Markert, Helmut; Rogler, Wolfgang; Bendel, Wolfgang; and Alber, Friedrich, 4,576,768, Cl. 264-27.000.

Bender, Steven L.: *See—*
Fletcher, George L., Jr.; Bender, Steven L.; and Wadsworth, Donald H., 4,577,024, Cl. 546-183.000.

Benjamin, James A.: *See—*
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,577,052, Cl. 136-246.000.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,577,208, Cl. 357-23.400.

Bennett Pump Company: *See—*
Swick, George E., Jr., 4,576,312, Cl. 222-27.000.

Benson, Alan M.; Mawer, John D.; and Ruzicka, Alan V., to W. S. Shamban & Company. Anti-extrusion back-up ring assembly. 4,576,386, Cl. 277-165.000.

Bentall, Richard H. C. Switched electrical apparatus for medical use. 4,576,172, Cl. 128-422.000.

Bentele, Benedikt; and Heerlein, Manfred, to Siemens Aktiengesellschaft. System for the continuous lubrication of a rolling bearing. 4,576,489, Cl. 384-469.000.

Bentley Engineering Company Limited: *See—*
Keel, Frederick; Townsend, Keith G.; and Carter, Marshall C., 4,576,019, Cl. 66-147.000.

Benton, Kenneth C.; and O'Kane, James L., to Standard Oil Company, The. Process for the production of acrylonitrile-propylene copolymers. 4,577,008, Cl. 526-342.000.

Benuzzi, Gino, to Giben Impianti S.p.A. Machine for stacking automatically packs of panels of different sizes on respective lifting platforms. 4,576,536, Cl. 414-51.000.

Berger, Hans S.: *See—*
Amici, Francis R.; Berger, Hans S.; Farrington, Richard I.; and Piazza, Pietro, 4,576,586, Cl. 446-315.000.

Bergische Achsenfabrik Fr. Kotz & Sohne: *See—*
Steiner, Helmut; Ebbinghaus, Wilfried; and Paech, Hartmut, 4,576,488, Cl. 384-291.000.

Bergman, Kjell; and Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace hearth connection. 4,577,326, Cl. 373-103.000.

Bernardi, Dario; and Pettinari, Maurizio. Device for spreading layers of dough of circular shape from dough masses of near spherical shape. 4,576,564, Cl. 425-337.000.

Bernecker, Gerhard, to Passat Maschinenbau GmbH. Press for pressing batches of articles dry. 4,575,949, Cl. 34-14.000.

Bernstein, Kerry, to International Business Machines Corporation. Support circuitry for multi-port systems. 4,577,292, Cl. 365-189.000.

Bertram, Leo, to U.S. Philips Corporation. Electric motor having two co-planar stator sections. 4,577,129, Cl. 310-112.000.

Besecke, Siegmund: *See—*
Baumgartner, Ehrenfried; Besecke, Siegmund; and Gaenzler, Wolfgang, 4,576,971, Cl. 521-108.000.
Liebler, Ralf; Besecke, Siegmund; and Munzer, Manfred, 4,576,870, Cl. 428-515.000.

Beyersbergen van Henegouwen, Cornelis M.: *See—*
Koken, Karel G. M.; van de Kerkhof, Hubertus F. W.; Olierook, John C. J.; and Beyersbergen van Henegouwen, Cornelis M., 4,576,345, Cl. 242-198.000.

Bhagat, Jayant K., to General Motors Corporation. Silicon nitride formation and use in self-aligned semiconductor device manufacturing method. 4,575,921, Cl. 29-571.000.

Bhatt, Ansuya P.: *See—*
Ehrlich, Paul; Anderson, Wayne A.; Kang, En T.; and Bhatt, Ansuya P., 4,576,887, Cl. 430-71.000.

Bickerstaff, David J., to Ferro Manufacturing Corporation. Flush glass window regulator. 4,575,967, Cl. 49-211.000.

Bimonte, Brian R.; Gauldin, Mark A.; and Riley, Douglas H., to AT&T Bell Laboratories. Telephone interexchange call routing. 4,577,066, Cl. 179-18.00B.

Bingham, George H.; Krupotich, Edward A.; and Rosensweig, Burton J., to Omation Corporation. Apparatus and method for checking the contents of envelopes and sorting documents by thickness. 4,576,287, Cl. 209-601.000.

Binkerd, Evan F.: *See—*
Tracy, Catherine O.; Binkerd, Evan F.; Rendek, Robert B.; and Wrobel, Raymond J., 4,576,825, Cl. 426-266.000.

Binkert, Gerald A. Collapsible house for cats. 4,576,116, Cl. 119-19.000.

Binoeder, Peter P.: *See—*
Whitacre, James B.; and Binoeder, Peter P., 4,577,318, Cl. 371-1.000.

BioChem Sensors, Inc.: *See—*
MacBride, William R.; Magee, James A.; Armiger, William B.; and Zabriskie, Dane W., 4,577,110, Cl. 250-461.200.

Birnbaum, David: *See—*
Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., 4,577,197, Cl. 346-75.000.

Bishop, John R.: *See—*
Morland, Robert B.; Cooke, Anson R.; and Bishop, John R., 4,576,629, Cl. 71-90.000.

Bitha, Panayota: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,577,018, Cl. 544-225.000.

Biziere, Kathleen: *See—*
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,576,946, Cl. 514-247.000.

Black & Decker Inc.: *See—*
Verdier, Alain; and Charton, Gilbert, 4,576,880, Cl. 429-99.000.
Winston, Walter E.; and Atkinson, Lowell G., 4,576,553, Cl. 417-9.000.

Blahous, Leopold; and Koppl, Georg, to BBC Brown, Boveri & Company, Limited. Method for limiting the fault-generated currents of circuit breakers in a high-voltage switching system and application of the method. 4,577,253, Cl. 361-62.000.

Blaising, Horst: *See—*
Goffredo, Daniel L.; Meyer, Walter J.; and Blaising, Horst, 4,576,685, Cl. 204-30.000.

Blaschke, Hans P.; Knappik, Winfried; Mette, Horst; and Scholler, Peter, to Messerschmitt-Bolkow-Blohm GmbH. Acoustic direction finder. 4,577,299, Cl. 367-120.000.

Blaskis, Edward A.: *See—*
Carlson, Roland W.; and Blaskis, Edward A., 4,577,340, Cl. 378-132.000.

Blaushild, Ronald M., to Westinghouse Electric Corp. Straddle-type support structure for nuclear power plant pressurizer valves. 4,576,788, Cl. 376-461.000.

Bleeke, William F., to CTS Corporation. Method for making a precision linear potentiometer sensor. 4,575,929, Cl. 29-620.000.

Blesser, Barry, to Pencept, Inc. Digitizing tablet system having stylus tilt correction. 4,577,057, Cl. 178-18.000.

Blessing, William R., Sr. Panel overhead support apparatus. 4,576,354, Cl. 248-354.500.

Blickenderfer, Jack L., to Westinghouse Electric Corp. Nuclear reactor fuel assembly peripheral rod lifting device. 4,575,930, Cl. 29-723.000.

Bliss, Robert J. Skin marker for use in biopsy excisions. 4,576,163, Cl. 128-305.000.

Block Drug Co., Inc.: *See—*
Ravel, Kanak K. R.; Vaidya, Bhupendra R.; and Nerizon, Nelly A., 4,576,645, Cl. 106-125.000.

Board of Regents, University of Texas System: *See—*
Zuccaro, Don R., 4,576,348, Cl. 244-173.000.

BOC Group, Inc., The: *See—*
Armond, John W.; and Smith, Kenneth C., 4,576,614, Cl. 55-18.000.

Bochumer Eisenhuette Heintzmann GmbH & Co. KG: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Hecken, Gerhard, 4,576,524, Cl. 405-260.000.

Boden, Richard M.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,576,739, Cl. 252-522.00R.

Bodenan, Rene; and Teculescu, Nicholas, to M.E.G., S.A. Hot air dryer structure. 4,575,952, Cl. 34-54.000.

Bodenseewerk Geratetechnic GmbH: *See—*
Gauggel, Roland; and Eckhardt, Reiner, 4,576,346, Cl. 244-3.160.

Boehringer Mannheim GmbH: *See—*
Adachi, Osao; and Ameyama, Minoru, 4,576,913, Cl. 435-26.000.

Boeing Commercial Airplane Company: *See—*
Anderson, Marlow C., 4,576,776, Cl. 264-510.000.

Boeing Company, The: *See—*
Jones, Everett E., 4,576,575, Cl. 432-253.000.
Korsch, Dietrich G., 4,576,447, Cl. 350-444.000.
Opsahl, Allan W., 4,576,347, Cl. 244-130.000.
Pinson, George T., 4,577,116, Cl. 290-43.000.

Boer, Jan; and Diepstraten, Wilhelmus J. M., to NCR Corporation. Digital data receiver including timing adjustment circuit. 4,577,334, Cl. 375-97.000.

Bohnes, Karlheinz: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Hecken, Gerhard, 4,576,524, Cl. 405-260.000.

Boik, Elmer J., to Continental White Cap, Inc. Tamper indicating fitment. 4,576,298, Cl. 215-252.000.

Bok, Edward. Apparatus for applying a coating on a substrate. 4,576,109, Cl. 118-50.000.

Boland, Michel A. G., to Region Wallone. Method for determining the stability of an orthopedic device composed of an external fixation bar during setting of bone fractures. 4,576,158, Cl. 128-92.00R.

Boldyrev, Vladimir V.: *See—*
Makkaev, Almaxud M.; Lomovsky, Oleg I.; Mikhailov, Jury I.; and Boldyrev, Vladimir V., 4,576,689, Cl. 204-20.000.

Boltrek, Henry; and Coakley, Peter J., Jr, to Westinghouse Electric Corp. Escalator. 4,576,276, Cl. 198-332.000.

Bommarito, Paul F. Ophthalmic guide for multi-focal spectacles. 4,575,946, Cl. 33-200.000.

Bond, James. Portable bag filling stand. 4,576,350, Cl. 248-97.000.

Boni, Fabio. Wheel balancing apparatus. 4,576,044, Cl. 73-462.000.

Boomer, John L.: *See—*
Burgher, Peter H.; and Boomer, John L., 4,577,085, Cl. 219-116.000.

Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., to Aluminum Company of America. Method for controlling powder production. 4,576,767, Cl. 264-12.000.

Bopp, Warren G., to Eaton Corporation. Torsion damping mechanism with variable damping. 4,576,259, Cl. 192-3.210.

Borg, John L. Reversible Magnus propeller. 4,576,581, Cl. 440-86.000.

Bornslaeger, S. Richard: *See—*
Jackson, David M.; Matthews, Billie J.; and Bornslaeger, S. Richard, 4,576,596, Cl. 604-370.000.

Borowsky, Richard. Light-occluding contact lens. 4,576,453, Cl. 351-162.000.

Borsig GmbH: *See—*
Nassauer, Konrad, 4,576,225, Cl. 165-101.000.

Borsoi, Bruno, to NORDICA S.p.A. Shoe, in particular a ski shoe, incorporating a flex and side and forward lean adjustment device. 4,575,955, Cl. 36-117.000.

Bory, William H., to Chesapeake Corporation. Order change method and apparatus for corrugator machine. 4,576,663, Cl. 156-64.000.

Bose Corporation: *See—*
Keezer, William J., 4,577,069, Cl. 179-119.00R.

Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, to Allied Corporation. Homogeneous, ductile iron based hardfacing foils. 4,576,873, Cl. 428-606.000.

Bottazzini, Nicola; and Quaglino, Marino, to Montedison S.p.A. Process for the purification of polyphenylene ethers. 4,577,010, Cl. 528-487.000.

Bourzat, Jean-Dominique; Cotrel, Claude; Farge, Daniel; Paris, Jean-Marc; and Taurand, Gerard, to Phone-Poulenc Sante. Anti-rheumatic 5-(substituted amino)-1,2-dithiol-3-one compounds and their use. 4,576,954, Cl. 514-314.000.

Boyer, Kent R.; and Cobb, Clyde E., to HR Textron Inc. Pressure-operated eccentric shaft coupling. 4,576,203, Cl. 137-625.630.

Bracker AG: *See—*
Neff, Andreas, 4,575,933, Cl. 29-765.000.

Bradley, Lindell P.: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,576,170, Cl. 128-419.00D.

Bradley, Robert F.; and Bradley, Lindell P., to Micro-Circuits Company. Heart monitor and defibrillator device. 4,576,170, Cl. 128-419.00D.

Brager, Howard R.: *See—*
Bates, John F.; Brager, Howard R.; and Korenko, Michael K., 4,576,641, Cl. 75-128.00P.

Braginski, Aleksander I.; and Male, Alan T., to Westinghouse Electric Corp. Submicron-particle ductile superconductor. 4,575,927, Cl. 29-599.000.

Braidt, Joseph W.: *See—*
Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.

Brain, Lucille M. Diaper magic, open plastic pants to hold cloth diapers or disposable liner. 4,576,601, Cl. 604-398.000.

Branco, Bernard; and Malandain, Michel, to Seppic. Film-forming compositions for enveloping solid forms, particularly pharmaceutical or food products or seeds, and products obtained, coated with said compositions. 4,576,646, Cl. 106-163.100.

Brandenstein, Manfred; Walter, Lothar; Haas, Roland; and Dobhan, Herbert, to SKF Kugellagerfabriken GmbH. Sliding sleeve for clutch shifters. 4,576,268, Cl. 192-98.000.

Brandl, Rudolf; and Danner, Helmut, to Heckler & Koxh GmbH. Small arm having a barrell with a transverse bore and a detachable silencer. 4,576,084, Cl. 89-14.400.

Brandt, Francois. Hydropneumatic energy-recuperating recoil brake for artillery pieces and firearms. 4,576,086, Cl. 89-43.010.

Brasell, James M.; and Nichols, Ernest, Jr. Device for lifting removable automobile tops. 4,576,542, Cl. 414-626.000.

Brasher, John K., to Atlantic Richfield Company. Apparatus for detecting the level of particulate solids in a shuttle car. 4,576,107, Cl. 116-227.000.

Braunsperger, Karl: *See—*
Kaufmann, Rudolf; Braunsperger, Karl; Wegehaupt, Karl-Heinrich; and von Au, Gunter, 4,577,040, Cl. 556-462.000.

Breidegam, Albert C., to Semtronics Corporation. Woven stretchable grounding strap. 4,577,256, Cl. 361-220.000.

Brekle, Erich: *See—*
Klingel, Hans; and Brekle, Erich, 4,575,969, Cl. 51-131.100.

Bremer, Joannes G.; and Compaan, Klaas, to U.S. Philips Corporation. Shaft encoder with an optical system comprising two straight-line-generatrix surfaces. 4,577,101, Cl. 250-231.0SE.

Brenig, Theodore, to General Electric Company. Digital decoding arrangement. 4,577,332, Cl. 375-40.000.

Bresser, Robert E.; Mesch, Keith A.; and Wursthorn, Karl R., to Morton Thiokol, Inc. Stabilizer compositions for PVC resins. 4,576,984, Cl. 524-182.000.

Bridgestone Corporation: *See—*
Harada, Jumei; Yamamoto, Keiji; and Yokoi, Takashi, 4,576,563, Cl. 425-194.000.
Oyachi, Tomio; Fukuda, Hiroya; and Anami, Masahiko, 4,576,859, Cl. 428-311.100.

Bridgestone Tire Co. Ltd.: *See—*
Yoda, Yasutada; Sueyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, 4,576,559, Cl. 425-28.00R.

Brie, Richard; and Guidoux, Loic B. Y., to Telecommunications Radioelectriques et Telephoniques T.R.T. Self-adaptive equalizer for baseband data signals. 4,577,329, Cl. 375-14.000.

Brink, T. A. Portable stroke victims arm rest. 4,576,351, Cl. 248-118.000.

Britax Vega Limited: *See—*
Tysoe, Nicholas W., 4,577,260, Cl. 362-61.000.

British Nuclear Fuels Limited: *See—*
McWilliam, Donald S.; and Minshall, David, 4,576,779, Cl. 376-203.000.

British Petroleum Company P.L.C., The: *See—*
Nay, Barry; and Stewart, David G., 4,576,968, Cl. 518-713.000.

British Telecommunications: *See—*
Johnston, Robert D.; and Forse, Nicholas J. A., 4,577,071, Cl. 179-170.200.

Broekhuis, Antonius A. Elastomeric copolymers, their preparation and their use. 4,577,002, Cl. 526-181.000.

Brogardh, Iorgny: *See—*
Adolfsson, Morgan; Brogardh, Iorgny; and Ovren, Christer, 4,577,189, Cl. 340-794.000.

Brons, Glen B.: *See—*
Siskin, Michael; and Brons, Glen B., 4,576,707, Cl. 208-8.0LE.

Brooks, Donald G. Harvester comb fingers. 4,575,998, Cl. 56-312.000.

Brother Industries, Ltd.: *See—*
Hibino, Masaaki, 4,577,206, Cl. 346-139.00R.

Broussaud, Daniel; Mustel, William; and Minjolle, Louis, to Armines; and Ceraver. Method of manufacturing parts or powders of a nitride compound of silicon or of a metal by reacting silicon or metal parts or powders in the solid state with a nitrogen-containing reactive gas. 4,576,923, Cl. 501-98.000.

Brown, Bill G. Block storage. 4,576,319, Cl. 224-42.410.

Brown, Boveri & Cie AG: *See—*
Hasenauer, Dieter; and Hug, Kuno, 4,576,881, Cl. 429-104.000.

Brown, George W.; and Thai, Phi, to Advanced Micro Devices, Inc. Redundant memory circuit and method of programming and verifying the circuit. 4,577,294, Cl. 365-200.000.

Brown, Robert L., to DMI Wireline, Inc. Device for facilitating release of stuck drill collars. 4,576,229, Cl. 166-177.000.

Browne, Gwendolen, to DeBlaueve Lier B.V. Phosphate-free detergent composition for washing of textiles in hard water. 4,576,727, Cl. 252-90.000.

Brumaghim, Milton W.: *See—*
Montgomery, John R.; Brumaghim, Milton W.; and Deniega, Jose C., 4,576,166, Cl. 128-325.000.

Brundage, Richard B.: *See—*
Terpstra, Daniel A.; and Brundage, Richard B., 4,576,072, Cl. 83-102.100.

Brunninger, Manfred: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,576,538, Cl. 414-339.000.

Brunswick Corporation: *See—*
Gruenwald, David J., 4,576,761, Cl. 261-23.00A.

Bruschi, Enrico, to Luigi Stoppani S.p.A. Stabilized adducts of menadione bisulfite with p-aminobenzoic acid or adenine. 4,577,019, Cl. 544-264.000.

Bruso, Loran H., to Warner-Lambert Company. Disposable sterilizer vacuum test pack. 4,576,795, Cl. 422-58.000.

Brux, Robert A., to Crown Zellerbach Corporation. System for securing a plurality of objects together with adhesive tape. 4,576,675, Cl. 156-468.000.

Bryans, Alexander C., to General Electric Company. Diffuser for a centrifugal compressor. 4,576,550, Cl. 415-211.000.

Bryant, Frank C.: *See—*
Hanson, Michael R.; and Bryant, Frank C., 4,576,532, Cl. 411-352.000.

Bryant, William R.: *See—*
Burgess, Kenneth W.; Bryant, William R.; and Erickson, Wayne K., 4,576,852, Cl. 428-171.000.

BS&B Safety Systems, Inc.: *See—*
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., 4,576,303, Cl. 220-89.00A.

Buchanan, Robert M.: *See—*
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,576,756, Cl. 260-396.00R.

Buchtel, Michael E. Cutlery storage apparatus. 4,575,939, Cl. 30-296.00A.

Buck, David A. Jaw assembly. 4,576,067, Cl. 81-185.100.

Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., to Cochlea Corporation. Parts sorting systems. 4,576,286, Cl. 209-558.000.

Buckley, Edward M.: *See—*
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Buckley, Thomas F., to Chevron Research. Methods for preventing the precipitation of mixed zinc dialkyldithiophosphates which contain high percentages of a lower alkyl group. 4,577,037, Cl. 556-25.000.

Buding, Hartmuth; Konigshofen, Heinrich; Szentivanyi, Zsolt; and Thormer, Joachim, to Bayer Aktiengesellschaft. Polymer mixtures. 4,576,992, Cl. 525-211.000.

Buhren, Heinz: *See—*
Aretz, Ulrich; and Buhren, Heinz, 4,576,340, Cl. 242-35.50A.

Bukatov, Alexandr S.: *See—*
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., 4,576,605, Cl. 623-2.000.

Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., to Westinghouse Electric Corp. Method and apparatus for controlling the control valve setpoint mode selection for an extraction steam turbine. 4,577,281, Cl. 364-494.000.

Bureau de Recherches Geologiques et Minieres: *See—*
Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, 4,576,717, Cl. 210-610.000.

Burgess, June: *See—*
Burgess, Robert H., 4,575,880, Cl. 4-313.000.

Burgess, Kenneth W.; Bryant, William R.; and Erickson, Wayne K., to Phillips Petroleum Company. Fusion of thermoplastic fabrics. 4,576,852, Cl. 428-171.000.

Burgess, Robert: *See—*
Burgess, Robert H., 4,575,880, Cl. 4-313.000.

Burgess, Robert H., to Burgess, Robert; and Burgess, June. Auto-flush system. 4,575,880, Cl. 4-313.000.

Burgher, Peter H.; and Boomer, John L., to Marelco Power Systems, Inc. System of transformers for a welding apparatus. 4,577,085, Cl. 219-116.000.

Burgher, Peter H.; and Marsden, Raymond F., to Marelco Power Systems. Transformer with fluid cooled windings. 4,577,175, Cl. 336-61.000.

Burkholder, Amy L.: *See—*
Adair, Paul C.; and Burkholder, Amy L., 4,576,891, Cl. 430-138.000.

Burkholder, Jack. Pressure fitting. 4,576,403, Cl. 285-39.000.

Burndy Corporation: *See—*
Verbruggen, Marcel, 4,576,427, Cl. 339-61.00M.

Burns, Gerald E.: *See—*
Suh, Sung L.; Burns, Gerald E.; and Silcox, William H., 4,576,520, Cl. 405-224.000.

Burr, August: *See—*
Kaeufer, Helmut; and Burr, August, 4,576,775, Cl. 264-323.000.

Burroughs Corporation: *See—*
Figueredo, Jorge H., 4,576,322, Cl. 228-4.500.
Nemiroff, Michael H., 4,575,922, Cl. 29-574.000.
Whitacre, James B.; and Binoeder, Peter P., 4,577,318, Cl. 371-1.000.

Burtea, Constantin, to Mastermatic, Inc. Tunnel heater. 4,576,090, Cl. 99-443.00C.

Busch, Dennis G., to International Business Machines Corporation. Data communications system with receiving terminal for varying the portions of received data being displayed. 4,577,288, Cl. 364-900.000.

Busch, Edgar: *See—*
Albrecht, Ernst; and Busch, Edgar, 4,576,103, Cl. 112-73.000.

Buteaux, Leonard J. Life preserver storage container. 4,577,262, Cl. 362-155.000.

Butler National Corporation: *See*—
Hilleary, Thomas N.; and Fulton, Robert D., 4,577,062, Cl. 179-2.00A.

Butt, Sheldon H., to Olin Corporation. Hermetically sealed metal package. 4,577,056, Cl. 174-52.0FP.

B.V. Haagse Bakkerijmachinefabriek: *See*—
Van der Togt, Jacobus C., 4,576,074, Cl. 83-358.000.

Bye, Michael E. Shoe construction with foot and ankle restraining means. 4,575,954, Cl. 36-89.000.

Bynum, Byron G.; and Cave, David L., to Motorola, Inc. Integrated circuit and method for biasing an epitaxial layer. 4,577,211, Cl. 357-34.000.

C. E. Shepherd Company: *See*—
Shepherd, G. Maury; and Shepherd, Charles E., 4,576,764, Cl. 261-111.000.

C. H. Masland & Sons: *See*—
Vaughn, Edward A.; and Clymin, Michael L., 4,576,853, Cl. 428-181.000.

C-I-L Inc.: *See*—
Murray, Charles R.; and Harrison, Ray E., 4,576,844, Cl. 428-35.000.

Cabral, Chavelo; Dean, Donald E.; and Lopez, Armando M. Safety seat closure. 4,575,879, Cl. 4-253.000.

Cadars, Patrick, to Valeo. Heat exchanger, in particular for a motor vehicle, and side sealing device therefor. 4,576,227, Cl. 165-149.000.

CAE Electronics, Ltd.: *See*—
Lam, Wim J.; Devries, Luitzen; McKinnon, Gordon M.; and Baribeau, Jean J., 4,576,577, Cl. 434-58.000.

Calabrese, Gary S.: *See*—
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,576,756, Cl. 260-396.00R.

California Institute of Technology: *See*—
Collins, Terrence J.; Anson, Fred C.; Gipson, Stephen L.; and Krafft, Terry E., 4,577,042, Cl. 564-158.000.
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,576,926, Cl. 502-339.000.

Cambier, Craig: *See*—
Mathews, Harlan P.; and Cambier, Craig, 4,577,301, Cl. 369-44.000.

Camet, Inc.: *See*—
Retallick, William B., 4,576,800, Cl. 422-180.000.

Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., to Occidental Chemical Corporation. Preparation of chlorotrifluoroethylene telomers with fluoroxytrifluoromethane. 4,577,044, Cl. 568-677.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Smallhorn, Edward A.; and Oliver, John B., 4,576,204, Cl. 138-44.000.

Canducci, Giancarlo: *See*—
Plicchi, Gianni; and Canducci, Giancarlo, 4,576,183, Cl. 128-723.000.

Canon Denshi Kabushiki Kaisha: *See*—
Okada, Shinichi, 4,577,251, Cl. 360-133.000.

Canon Kabushiki Kaisha: *See*—
Fukuda, Tsuyoshi; and Aihara, Yoshihiko, 4,576,457, Cl. 354-173.110.
Hara, Toshitami, 4,577,202, Cl. 346-140.00R.
Kamata, Shigeru, 4,576,446, Cl. 350-429.000.
Kitagawa, Takahiro; and Totsuka, Masao, 4,576,475, Cl. 355-91.000.
Miura, Yuzo; and Yamada, Akira, 4,576,459, Cl. 354-287.000.
Okino, Tadashi; and Saito, Syuichiro, 4,576,456, Cl. 352-216.000.

Cantwell, Gill. Floppy disc rotational apparatus. 4,577,248, Cl. 360-97.000.

Cantwell, Gill. Disc loading apparatus. 4,577,249, Cl. 360-99.000.

Capra, Pier C.: *See*—
Lupo, Giorgio; Capra, Pier C.; and Marcarino, Aldo, 4,576,264, Cl. 192-48.910.

Caputo, Garry L. "On demand" apparatus and method for producing air-cushioning product. 4,576,669, Cl. 156-145.000.

Cardoso, Jean-Francois: *See*—
Fink, Mathias A.; and Cardoso, Jean-Francois, 4,576,046, Cl. 73-631.000.

Cardus, Francis: *See*—
Alazet, Jean, 4,575,902, Cl. 19-2.000.

Cargould, Barry D., to Eagle-Picher Industries, Inc. Device for measuring extraneous losses in apparatus for measuring the rolling resistance of tires. 4,576,040, Cl. 73-146.000.

Carl-Zeiss-Stiftung: *See*—
Westphal, Klaus, 4,576,450, Cl. 350-522.000.

Carlson, Frederick D.; and Hart, Ronald E., to J. I. Case Company. Sealed bushing assembly for pivotal members. 4,575,898, Cl. 16-274.000.

Carlson, Roland W.; and Blaskis, Edward A., to Technicare Corporation. High vacuum rotating anode X-ray tube. 4,577,340, Cl. 378-132.000.

Carlson, Timothy L.: *See*—
Ward, John W.; and Carlson, Timothy L., 4,576,711, Cl. 208-111.000.

Carlstedt, Richard A., to Miner Enterprises, Inc. Draft gear for railroad car coupler system. 4,576,295, Cl. 213-32.00R.

Carmichael, Hoagy C.; and Schooler, Miles R. Orthopedic leg appliance. 4,576,151, Cl. 128-80.00C.

Carmichael, Kathleen M.: *See*—
Badesha, Santokh S.; Pai, Damodar M.; Carmichael, Kathleen M.; and Tarnawskyj, Ihor W., 4,576,634, Cl. 75-0.50A.

Carney, James K.; and Kolbas, Robert M., to Honeywell Inc. Integrated quantum well lasers for wavelength division multiplexing. 4,577,321, Cl. 372-50.000.

Carolina Power and Light Company: *See*—
Clements, Talmage B.; and Dresser, Thomas M., 4,576,785, Cl. 376-435.000.

Carpenter, George J., to Warner-Lambert Technologies, Inc. Catheter with optimum resistance to bending and method of manufacture. 4,576,772, Cl. 264-154.000.

Carre, Jean J.; and Meynier, Guy, to Societe Anonyme D.B.A. Disc brake with removable caliper reinforcing arm. 4,576,257, Cl. 188-73.320.

Carre, Jean-Jacques: *See*—
Mery, Jean-Claude; Carre, Jean-Jacques; and Thioux, Alain, 4,576,255, Cl. 188-71.500.

Carreira, A. William. Soldering technique. 4,577,083, Cl. 219-85.00F.

Carrera, Luciano: *See*—
Azzola, Roberto; and Carrera, Luciano, 4,576,773, Cl. 264-167.000.

Carroll, William G.; and Rosbotham, Ian D., to Imperial Chemical Industries, PLC. Polyol compositions and polyurethane foams manufactured therefrom. 4,576,974, Cl. 521-173.000.

Cart-O-Matic Aktiebolag: *See*—
Thorsen, Kjeld, 4,576,274, Cl. 194-210.000.

Carter, Charles G., to Stauffer Chemical Company. Certain aryloxyphenoxy oxoimidazolidines and method of use. 4,576,631, Cl. 71-92.000.

Carter-Day Company: *See*—
Melin, Gerald W., 4,576,713, Cl. 209-254.000.

Carter-Hoffman Corporation: *See*—
Pinnow, Curtis C.; and Gill, Brian, 4,576,425, Cl. 312-324.000.

Carter, Marshall C.: *See*—
Keel, Frederick; Townsend, Keith G.; and Carter, Marshall C., 4,576,019, Cl. 66-147.000.

Cassella Aktiengesellschaft: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.

Castner, Raymond P.: *See*—
Copper, Frank W., Jr.; and Castner, Raymond P., 4,576,546, Cl. 414-744.00R.

Castolin S.A.: *See*—
Muller, Niklaus; and Audemars, Daniel, 4,576,526, Cl. 406-75.000.

Casula, Pierluigi: *See*—
Rovati, Luigi; Makovec, Francesco; Senin, Paolo; and Casula, Pierluigi, 4,576,951, Cl. 514-282.000.

Caterpillar Tractor Co.: *See*—
Gee, James E., 4,575,959, Cl. 37-4.000.
Holzinger, Charles E.; and Fee, David M., 4,576,418, Cl. 303-71.000.

Caterpiller Tractor Co.: *See*—
Molnar, John; and Porter, Robert B., Jr., 4,576,414, Cl. 297-476.000.

Caudel, Edward R.; and Magar, Surendar S., to Texas Instruments Incorporated. Microcomputer system for digital signal processing. 4,577,282, Cl. 364-200.000.

Caumont, Jean-Francois, to Tempo Sanys. Apparatus for producing cloth cut outs for packaging in a container together with the production at a different rate of closure cut out for the container. 4,575,992, Cl. 53-520.000.

Cave, David L.: *See*—
Bynum, Byron G.; and Cave, David L., 4,577,211, Cl. 357-34.000.

Celanese Corporation: *See*—
David, Lawrence D., 4,576,688, Cl. 204-157.620.
Hargett, Wyatt P., Jr., 4,576,769, Cl. 264-51.000.

Central Mine Equipment: *See*—
Rassieur, Charles L., 4,576,498, Cl. 403-24.000.

Centre National de la Recherche Scientifique: *See*—
Monsigny, Michel, 4,576,745, Cl. 260-112.50R.

Ceraver: *See*—
Broussaud, Daniel; Mustel, William; and Minjolle, Louis, 4,576,923, Cl. 501-98.000.

Certech Incorporated: *See*—
Uram, Stuart Z., 4,576,219, Cl. 164-358.000.

Chadbourne, Lester E., deceased: *See*—
Olivier, Paul D.; and Chadbourne, Lester E., deceased, 4,576,551, Cl. 416-191.000.

Chadbourne, Mary T., personal representative: *See*—
Olivier, Paul D.; and Chadbourne, Lester E., deceased, 4,576,551, Cl. 416-191.000.

Chadwick, John R., to Fairey Engineering Limited. Apparatus for laser welding pipes and the like. 4,577,087, Cl. 219-121.0LC.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Coin operated pull-down door and door spring mechanism for vending machine. 4,576,271, Cl. 194-233.000.

Chambers, Worthy L.; Jones, William H.; and Hayden, Arthur H., to Eaton Corporation. Programmer/timer for appliances. 4,577,179, Cl. 340-309.150.

Champion International Corporation: *See*—
Hain, Paul O., 4,576,566, Cl. 425-400.000.
Lepisto, J. George, 4,576,210, Cl. 141-115.000.

Chang, Clarence D.; Chu, Cynthia T. W.; and Miale, Joseph N., to Mobil Oil Corporation. Increasing lattice metal content of porous inorganic crystalline compositions. 4,576,805, Cl. 423-277.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Catalysis over activated high silica zeolites. 4,577,048, Cl. 585-467.000.

Chappelear, Robert N.; and Symborski, Alex P., to Owens-Corning Fiberglas Corporation. Apparatus for producing chopped strands of glass fibers. 4,576,621, Cl. 65-10.200.
Charney, Gregory S.; Hohner, Terrance D.; and Salibello, Cosmo, to Terrance D. Hohner. Eye fatigue simulator for optometry. 4,576,454, Cl. 351-243.000.
Chartier, George R., to O. J. Ouellette Inc. Attachment cap for fastener head. 4,576,533, Cl. 411-373.000.
Charton, Gilbert: *See*—
Verdier, Alain; and Charton, Gilbert, 4,576,880, Cl. 429-99.000.
Chatterjee, Ananda M.; and Hayden, Earl E., to Shell Oil Company. Polymeric composition useful for hot water pipe service. 4,576,983, Cl. 524-101.000.
Chauvin, John A. Automatic roux maker. 4,576,089, Cl. 99-332.000.
Chen, Carson: *See*—
Wong, Hee; and Chen, Carson, 4,577,335, Cl. 375-86.000.
Chen, Catherine S. H.; and Williams, Albert L., to Mobil Oil Corporation. Chemically stable stiff backbone polymers as mobility control agents in oil recovery. 4,577,000, Cl. 525-534.000.
Chen, Cheng C. Necktie. 4,575,872, Cl. 2-144.000.
Cherill, Robert J.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,577,026, Cl. 546-216.000.
Chervenak, Michael C.: *See*—
Nongbri, Govanon; and Chervenak, Michael C., 4,576,710, Cl. 208-58.000.
Chesapeake Corporation: *See*—
Bory, William H., 4,576,663, Cl. 156-64.000.
Chevron Research: *See*—
Buckley, Thomas F., 4,577,037, Cl. 556-25.000.
Chevron Research Company: *See*—
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,576,232, Cl. 166-274.000.
Nguyen, Tanh V., 4,576,043, Cl. 73-195.000.
Suh, Sung L.; Burns, Gerald E.; and Silcox, William H., 4,576,520, Cl. 405-224.000.
Chiang, Chawan-Kang: *See*—
Davis, George T.; Chiang, Chawan-Kang; Antonucci, Joseph M.; and Takahashi, Toru, 4,576,882, Cl. 429-192.000.
Chiang, Ping-Wang, to Amdahl Corporation. Integrated circuit multilevel interconnect system and method. 4,576,900, Cl. 430-313.000.
Chisso Corporation: *See*—
Sugimori, Shigeru; Isoyama, Toyoshiro; and Goto, Yasuyuki, 4,576,733, Cl. 252-299.670.
Chiusole, Erwin; and Zullig, Hans, to Zullig AG Rheineck. Apparatus for the electrochemical detection of the oxygen content of liquids. 4,576,704, Cl. 204-402.000.
Chlystun, Walter K. Apparatus for forming a dispensing container. 4,576,565, Cl. 425-383.000.
Cho, Michio; Suzuki, Masane; and Saito, Takayuki, to Fuji Photo Film Co., Ltd. Camera finder employing holographic view field frames. 4,576,458, Cl. 354-199.000.
Chr. Eisele Maschinenfabrik GmbH & Co. KG: *See*—
Holder, Kurt, 4,576,075, Cl. 83-464.000.
Chrin, Christopher J., to AT&T Bell Laboratories. Method and apparatus for generating digital signals representing periodic samples of a sine wave. 4,577,287, Cl. 364-721.000.
Christiansen, Ari R. E.: *See*—
Skantz, Kaj M.; and Christiansen, Ari R. E., 4,576,643, Cl. 106-14.240.
Christy, Arthur E.; and Gill, Elmer J., to International Business Machines Corporation. Adaptive robot batch assembly system. 4,577,284, Cl. 364-513.000.
Chronar Corp.: *See*—
Kiss, Zoltan, 4,576,830, Cl. 427-39.000.
Chu, Cynthia T. W.: *See*—
Chang, Clarence D.; Chu, Cynthia T. W.; and Miale, Joseph N., 4,576,805, Cl. 423-277.000.
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., to AT&T Bell Laboratories. Digital multi-customer data interface. 4,577,314, Cl. 370-94.000.
Chu, Paul C.; and Mercola, Gerald K., to ICS Electronics Corporation. Method for extending a parallel data bus. 4,577,317, Cl. 370-110.100.
Ciba-Geigy AG: *See*—
Fryberg, Mario; Schaller, Heinrich; Steiger, Rolf; and Peter, Heinz, 4,576,885, Cl. 430-390.000.
Ciba-Geigy Corporation: *See*—
Falk, Robert A., 4,577,036, Cl. 549-556.000.
Martin, Henry; and Fricker, Urs, 4,576,628, Cl. 71-88.000.
Martin, Pierre; and Steiner, Eginhard, 4,577,028, Cl. 546-345.000.
Merz, Jurg; and Voser, Walter, 4,577,013, Cl. 536-43.000.
Cichanski, William J.: *See*—
Mast, Robert F.; Cichanski, William J.; Walker, Francis R.; and Magura, Donald D., 4,576,519, Cl. 405-207.000.
Ciciora, Walter S.: *See*—
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Cidelcem: *See*—
Tzifkansky, Guy; and Marchais, Jean-Claude, 4,576,309, Cl. 220-366.000.
Cities Service Oil & Gas Corp.: *See*—
Oko, Uriel M.; and Baldwin, Robert M., 4,576,708, Cl. 208-11.0LE.
Clark, Richard E.; Tacito, Louis D.; Miller, Bryan H.; and Beck, Martin H., to Continental Packaging Company, Inc. Method of forming a composite container. 4,575,915, Cl. 29-509.000.
Clark, William T., III. Method of immune modification by means of extracorporeal irradiation of the blood. 4,576,143, Cl. 128-1.00R.
Clawson, Lawrence G.: *See*—
Massey, Lester G.; Clawson, Lawrence G.; and Syska, Andrew J., 4,575,948, Cl. 34-10.000.
Clements, Talmage B.; and Dresser, Thomas M., to Carolina Power and Light Company. Reduction in rate of radiation exposure to excore nuclear reactor components. 4,576,785, Cl. 376-435.000.
Clerc, Guy, to Thomson-CSF. Direct heating cathode and a process for manufacturing same. 4,577,134, Cl. 313-346.00R.
Clinique de la Residence du Parc: *See*—
Pol, Vincent; and Dumas, Jean-Claude, 4,576,606, Cl. 623-3.000.
Clymin, Michael L.: *See*—
Vaughn, Edward A.; and Clymin, Michael L., 4,576,853, Cl. 428-181.000.
Coakley, James L.; and Haydt, Richard J., deceased (by Haydt, Mette, legal representative), to HR Textron Inc. Servovalve with integrated failure monitoring. 4,576,198, Cl. 137-596.000.
Coakley, Peter J., Jr: *See*—
Boltrek, Henry; and Coakley, Peter J., Jr, 4,576,276, Cl. 198-332.000.
Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Foster, Pierce W., 4,577,009, Cl. 528-228.000.
Cobb, Clyde E.: *See*—
Boyer, Kent R.; and Cobb, Clyde E., 4,576,203, Cl. 137-625.630.
Coca-Cola Company, The: *See*—
Morgan, Annis R., Jr.; Mehlan, Bernd; Gress, Josef; and Williford, Hugh S., 4,576,272, Cl. 194-215.000.
Coccia, Mario: *See*—
Valentini, Luigi; and Coccia, Mario, 4,576,211, Cl. 141-329.000.
Cochlea Corporation: *See*—
Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., 4,576,286, Cl. 209-558.000.
Codman & Shurtleff, Inc.: *See*—
Kraus, Robert G.; Kunica, Enora S.; and Praderio, Joseph J., 4,576,589, Cl. 604-8.000.
Cogswell, Jesse G. Rigid wire saw wheel apparatus for very hard materials. 4,576,139, Cl. 125-21.000.
Cohen, Edwin J. Optical instrument for measuring angles. 4,576,478, Cl. 356-149.000.
Cohen, Lester R., to Badger B.V. Method for separating carboxylic acids from mixtures with non-acids. 4,576,683, Cl. 203-15.000.
Cohen, Mary, executrix: *See*—
Cohen, Nathan, deceased; and Cohen, Mary, executrix, 4,576,336, Cl. 239-33.000.
Cohen, Nathan, deceased; and Cohen, Mary, executrix. Drinking straw. 4,576,336, Cl. 239-33.000.
Coleco Industries, Inc.: *See*—
Amici, Francis R.; Berger, Hans S.; Farrington, Richard I.; and Piazza, Pietro, 4,576,586, Cl. 446-315.000.
Coleman, Kevin G.: *See*—
Lipscher, Bernard; and Coleman, Kevin G., 4,577,181, Cl. 340-522.000.
Coleman, William M., III; and Edmondson, Morris S., to Dow Chemical Company, The. Polymerization of olefins employing a catalyst containing a titanium component derived from hydroxyalkyl aromatic compounds. 4,577,001, Cl. 526-127.000.
Colgate-Palmolive Company: *See*—
Colodney, Daniel; and Steltenkamp, Robert J., 4,576,738, Cl. 252-559.000.
Colley, Alice M.: *See*—
Verbicky, John W., Jr.; and Colley, Alice M., 4,577,033, Cl. 548-461.000.
Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, to Bureau de Recherches Geologiques et Minieres. Process for denitrifying subterreanean waters to make them potable. 4,576,717, Cl. 210-610.000.
Collins, Mark C., to Sony Corporation. Error correction in digital television signals. 4,577,237, Cl. 358-336.000.
Collins, Robert J. Current-ratio digitizers. 4,577,058, Cl. 178-18.000.
Collins, Terrence J.; Anson, Fred C.; Gipson, Stephen L.; and Krafft, Terry E., to California Institute of Technology. Homogeneous coordination compounds as oxidation catalysts. 4,577,042, Cl. 564-158.000.
Colliver, Anthony D.: *See*—
Wrightson, Robert W.; and Colliver, Anthony D., 4,576,505, Cl. 403-362.000.
Colman, Derek A.; and Thew, Martin T. Cyclone separator. 4,576,724, Cl. 210-788.000.
Colmet, Robert; Naslain, Roger; Hagenmuller, Paul; and Lamico, Pierre. Method for producing a refractory composite structure. 4,576,836, Cl. 427-255.000.
Colodney, Daniel; and Steltenkamp, Robert J., to Colgate-Palmolive Company. Hard surface cleaning compositions containing pianane. 4,576,738, Cl. 252-559.000.
Colt Industries Operating Corp.: *See*—
Corrette, Richard H., 4,576,033, Cl. 72-469.000.
Columbus McKinnon Corporation: *See*—
Pancook, James J., 4,576,363, Cl. 254-372.000.
Combes, Gilles; and Delage, Germain, to Alsthom-Atlantique. Rotary sluice gate. 4,576,512, Cl. 405-100.000.
Combi Co., Ltd.: *See*—
Nakao, Shinroku; and Tsuchiya, Kunimasa, 4,575,896, Cl. 16-35.00R.

Combs, Cathy M.; Duffy, Joseph K.; and Thoene, Mark, to Baxter Travenol Laboratories, Inc. Insulated shipping container. 4,576,017, Cl. 62-372.000.

Combustion Engineering, Inc.: *See—*
Palmer, David N., 4,576,697, Cl. 204-192.00N.

Comerford, Liam D.; and White, Steve R., to International Business Machines Corporation. Hardware key-on-disk system for copy-protecting magnetic storage media. 4,577,289, Cl. 364-900.000.

Commissariat a l'Energie Atomique: *See—*
Belz, Gerard, 4,576,780, Cl. 376-235.000.
Conche, Francois; and Montret, Jean-Francois, 4,577,112, Cl. 250-506.100.
Miline, Francois, 4,576,613, Cl. 55-1.000.

Compaan, Klaas: *See—*
Bremer, Joannes G.; and Compaan, Klaas, 4,577,101, Cl. 250-231.0SE.

Compagnie des Produits Industriels de l'Quest (C.P.I.O.): *See—*
Gallas, Gerard; Raher, Loic; and Renzo, Bernard, 4,576,366, Cl. 267-8.00R.

Compagnie Francaise des Petroles: *See—*
Herve, Jean-Luc A., 4,576,193, Cl. 137-15.000.

Computer Air Corp.: *See—*
Luzenberg, Robert S., 4,576,012, Cl. 62-157.000.

Conagra, Inc.: *See—*
Tracy, Catherine O.; Binkerd, Evan F.; Rendek, Robert B.; and Wrobel, Raymond J., 4,576,825, Cl. 426-266.000.

Conche, Francois; and Montret, Jean-Francois, to Commissariat a l'Energie Atomique. Movable enclosure for the replacement and transportation of contaminated parts and complementary casing for such an enclosure. 4,577,112, Cl. 250-506.100.

Conklin, Sharon J.: *See—*
Auerbach, Steven L.; and Conklin, Sharon J., 4,575,871, Cl. 2-6.000.

Conover, Gilbert, Jr.; and Richard, Gary R., to Independent Energy, Inc. Thermally responsive electrical control device and monitoring circuit therefor. 4,576,487, Cl. 374-183.000.

Conrad, Joseph. Permanent mooring method and arrangement. 4,576,521, Cl. 405-225.000.

Consolidated Natural Gas Service Company, Inc.: *See—*
Massey, Lester G.; Clawson, Lawrence G.; and Syska, Andrew J., 4,575,948, Cl. 34-10.000.

Consonni, Pietro: *See—*
Favara, Duccio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,576,746, Cl. 260-239.00A.

Continental Group, Inc., The: *See—*
Beck, Martin H.; and Krishnakumar, Suppayan M., 4,576,843, Cl. 428-35.000.

Continental Manufacturing and Sales Inc.: *See—*
Pohoreski, Anton P., 4,576,714, Cl. 210-195.100.

Continental Packaging Company, Inc.: *See—*
Clark, Richard E.; Tacito, Louis D.; Miller, Bryan H.; and Beck, Martin H., 4,575,915, Cl. 29-509.000.

Continental White Cap, Inc.: *See—*
Boik, Elmer J., 4,576,298, Cl. 215-252.000.
Lecinski, Frank H., 4,576,296, Cl. 215-31.000.
Lecinski, Frank H., Jr., 4,576,299, Cl. 215-318.000.

Cooke, Anson R.: *See—*
Morland, Robert B.; Cooke, Anson R.; and Bishop, John R., 4,576,629, Cl. 71-90.000.

Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., to EPI Resources Ltd. Fixed/-movable marine structure system. 4,576,518, Cl. 405-205.000.

Coolair Corporation Pte. Ltd.: *See—*
Wrightson, Robert W.; and Colliver, Anthony D., 4,576,505, Cl. 403-362.000.

Cooper, Glenn D., deceased (by Cooper, Rose, executrix); and Ting, Sai-Pei, to General Electric Company. UV-Resistant flame retardant compositions of polycarbonates and halogenated alkenyl aromatic copolymers. 4,576,991, Cl. 525-146.000.

Cooper, Rose, executrix: *See—*
Cooper, Glenn D., deceased; and Ting, Sai-Pei, 4,576,991, Cl. 525-146.000.

Copeland, John A., to AT&T Bell Laboratories. Dual wavelength optical source. 4,577,207, Cl. 357-17.000.

Copper, Frank W., Jr.; and Castner, Raymond P., to Westinghouse Electric Corp. Method for servicing a steam generator. 4,576,546, Cl. 414-744.00R.

Corbet, Aaron B.; Holliger, Christoph; and Strul, Bruno, to United States of America, Health and Human Services. Method and apparatus for measuring density profiles in microscopic tube flow. 4,576,477, Cl. 356-39.000.

Cordis Corporation: *See—*
Hooven, Michael D.; and Saulson, Stanley H., 4,576,035, Cl. 73-4.00R.

Cornet, Jean, to Thomson-CSF. Thermo-optical data writing process and data medium for performing this process. 4,577,291, Cl. 365-126.000.

Corning Glass Works: *See—*
Hazard, Gary M.; Hillman, Arthur E.; Montierth, Max R.; and Nieber, Albert R., 4,576,774, Cl. 264-267.000.
Hertl, William; and Weetall, Howard H., 4,576,687, Cl. 204-157.500.
MacDowell, John F., 4,576,920, Cl. 501-10.000.
Mann, George H., 4,576,623, Cl. 65-30.140.

Corrette, Richard H., to Colt Industries Operating Corp. Thread rolling die construction. 4,576,033, Cl. 72-469.000.

Cortese, Richard: *See—*
Guittard, George V.; Deters, Joseph C.; Theeuwes, Felix; and Cortese, Richard, 4,576,604, Cl. 604-890.000.

Corvers, Antonius; and Hofman, Johannes H. A., to Stamicarbon B.V. Diazabicyclo (2,2,2) octadiones. 4,577,023, Cl. 546-122.000.

Cosnet, Pascal. Device for stowing loads of large-sized bales of fodder on a vehicle. 4,576,531, Cl. 410-36.000.

Cotrel, Claude: *See—*
Bourzat, Jean-Dominique; Cotrel, Claude; Farge, Daniel; Paris, Jean-Marc; and Taurand, Gerard, 4,576,954, Cl. 514-314.000.

Coufal, Hans J.: *See—*
Barton, Roger W.; Coufal, Hans J.; Jipson, Victor B.; and Lee, Wen Y., 4,576,895, Cl. 430-270.000.

Courvoisier, Guy: *See—*
Arieh, Simon; and Courvoisier, Guy, 4,575,958, Cl. 36-121.000.

Cowlam, Stephen K.; Moss, Steven Y.; Stockwell, Claude L.; and Phillips, Victor R., to United Kingdom Atomic Energy Authority. Sphere/liquid separator and separation method. 4,576,765, Cl. 210-801.000.

Cox, Andrew P. D., to Dunlop Limited. Leak detectors. 4,576,037, Cl. 73-40.50R.

Cox, Don C., to Otis Engineering Corporation. Hydraulically actuated slip assembly. 4,576,254, Cl. 188-67.000.

Crawford, A. Gerrit. Lightweight high pressure tubular storage system for compressed gas and method for cryogenic pressurization. 4,576,015, Cl. 62-292.000.

Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., to Xerox Corporation. Ink jet printer droplet height sensing control. 4,577,197, Cl. 346-75.000.

Crepinsek, Alois. Door stile lock and latch bolt assembly. 4,576,023, Cl. 70-137.000.

Crisp, John H.: *See—*
Stout, Gregg W.; Nelson, John A.; and Crisp, John H., 4,576,236, Cl. 166-386.000.

Crockatt, William B.; and Rimma, John, to DeSoto, Inc. Aqueous water-repellent coatings. 4,576,987, Cl. 524-487.000.

Croopnick, Gerald A.: *See—*
Michaels, John M.; Croopnick, Gerald A.; and Morris, Richard A., 4,576,715, Cl. 210-347.000.

Crossley, Roger; and Dickinson, Kay H., to John Wyeth & Brother, Ltd. Pyridylalkylenethiopyridyls. 4,576,955, Cl. 514-335.000.

Crossley, Roger; and Shepherd, Robin G., to John Wyeth & Brother, Ltd. Silyl compounds. 4,577,022, Cl. 546-14.000.

Crown Zellerbach Corporation: *See—*
Brux, Robert A., 4,576,675, Cl. 156-468.000.

Crucible Materials Corporation: *See—*
Holtz, Frederick C., Jr., 4,576,642, Cl. 75-239.000.

Csapo, Erich: *See—*
Kurt, Prunbauer; and Csapo, Erich, 4,576,026, Cl. 70-380.000.

CTS Corporation: *See—*
Bleeke, William F., 4,575,929, Cl. 29-620.000.

Culp, Norman L., to Honeywell Inc. Digital phase locked loop. 4,577,163, Cl. 331-1.00A.

Curran, Roger: *See—*
Mikuta, Richard; and Curran, Roger, 4,575,961, Cl. 42-1.00S.

Curt G. Joa, Inc.: *See—*
Joa, Curt G., 4,576,600, Cl. 604-390.000.

Cutler, Christopher A.: *See—*
Wallace, William D.; and Cutler, Christopher A., 4,576,181, Cl. 128-675.000.

Dai, Shenghong A., to Upjohn Company, The. Isocyanato-azetidinediones. 4,576,747, Cl. 260-239.00A.

Dai, Shenghong A.; and Sherwood, Philip W., to Dow Chemical Company, The. Azetidinedione compounds as crosslinkers for electrodeposited coatings. 4,576,980, Cl. 523-420.000.

Daigle, Colastie J.: *See—*
Smith, Malcolm S.; and Daigle, Colastie J., 4,576,821, Cl. 426-1.000.

Daikin Kogyo Co., Ltd.: *See—*
Harada, Tokuya; Higashiura, Tadashi; and Okubo, Misae, 4,576,915, Cl. 435-101.000.
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Yamasaki, Masahiro; Hirose, Iwao; Fukushima, Masao; and Yoshida, Ichiro, 4,576,467, Cl. 355-10.000.

Daitoku, Koichi; and Tsukahara, Daiki, to Nippon Kogaku K. K. Photographing lens position device in automatic focusing camera. 4,576,460, Cl. 354-400.000.

Danby, Hal C., to Anatros Corporation. Dual source parenteral infusion apparatus. 4,576,592, Cl. 604-80.000.

Dancey, James N.: *See—*
Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., 4,576,518, Cl. 405-205.000.

Danfoss A/S: *See—*
Neldeberg, Poul; and Olsen, Steen H., 4,576,332, Cl. 237-2.00B.

Daniel, Maurice. Light distribution and collection assemblies and methods. 4,576,436, Cl. 350-96.100.

Danilova, Zinaida P.: *See—*
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., 4,576,605, Cl. 623-2.000.

Danner, Helmut: *See—*
Brandl, Rudolf; and Danner, Helmut, 4,576,084, Cl. 89-14.400.

Dansk Industri Syndikat A/S: *See—*
Kauserud, Hakon, 4,576,215, Cl. 164-15.000.

Datta, Amitava: *See—*
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,576,873, Cl. 428-606.000.

Daussan, Andre : *See—*
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,576,365, Cl. 266-220.000.

Daussan et Compagnie: *See—*
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,576,365, Cl. 266-220.000.

Daussan, Gerard: *See—*
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,576,365, Cl. 266-220.000.

Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, to Daussan et Compagnie. Device for the removal of inclusions contained in molten metals. 4,576,365, Cl. 266-220.000.

Davi, Horace: *See—*
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,576,946, Cl. 514-247.000.

David, Lawrence D., to Celanese Corporation. Production of poly(p-phenylene) from 4,4'-dihalobiphenyl and lithium using ultrasonic waves. 4,576,688, Cl. 204-157.620.

Davies, William A. Vacuum sheet. 4,576,823, Cl. 428-61.000.

Davis, George T.; Chiang, Chawan-Kang; Antonucci, Joseph M.; and Takahashi, Toru, to United States of America, Navy. Polyethylene imine-metal salt solid electrolyte. 4,576,882, Cl. 429-192.000.

Dawson, Chris R.; Dondero, John; and Parks, Gerald R., to Gregory, John R. Detachable visor for a motorcycle helmet. 4,575,875, Cl. 2-422.000.

Dayen, Leonid: *See—*
Schilling, Hugh K.; Dayen, Leonid; and Raines, Charles D., 4,576,266, Cl. 192-70.120.

de la Cierva, Juan, Jr.: *See—*
de la Cierva, Juan, Sr.; and de la Cierva, Juan, Jr., 4,577,229, Cl. 358-182.000.

de la Cierva, Juan, Sr.; and de la Cierva, Juan, Jr. Special effects video switching device. 4,577,229, Cl. 358-182.000.

Deal, Philip A., to R. J. Reynolds Tobacco Company. Variable air dilution cigarette filter. 4,576,187, Cl. 131-336.000.

Deal, Troy M. Dredge cutterhead. 4,575,960, Cl. 37-63.000.

Dean, Donald E.: *See—*
Cabral, Chavelo; Dean, Donald E.; and Lopez, Armando M., 4,575,879, Cl. 4-253.000.

Dearing, James C. Air duct register mounting clip. 4,576,349, Cl. 248-27.100.

DeBergalis, Michael, to Du Pont de Nemours, E. I., and Company. Polymers containing resorcinol monobenzoate. 4,577,007, Cl. 526-321.000.

DeBlaueve Lier B.V.: *See—*
Browne, Gwendolen, 4,576,727, Cl. 252-90.000.

DeBoon, George B.: *See—*
Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., 4,576,518, Cl. 405-205.000.

DeCristofaro, Nicholas J.: *See—*
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,576,873, Cl. 428-606.000.

Deep, George: *See—*
Smyth, Laurence C.; and Deep, George, 4,576,220, Cl. 164-66.100.

Degussa Aktiengesellschaft: *See—*
Rothaut, Josef; Hausselt, Jurgen; Steinke, Rudi; and Klaus, Angela, 4,576,790, Cl. 420-464.000.

Delage, Germain: *See—*
Combes, Gilles; and Delage, Germain, 4,576,512, Cl. 405-100.000.

Delahunty, Michael D., to Ducata Limited. Fixing article holders to surfaces. 4,576,664, Cl. 156-71.000.

Delcon Oy: *See—*
Juutilainen, Timo, 4,577,267, Cl. 363-19.000.

DeLuca, Paul V.; and Hung, Peter, to Porta Systems Corp. Protective boot for telephone subscriber jacks. 4,576,428, Cl. 339-94.00R.

Demangeon, Francis; Hagenbach, Germain; and Maldonado, Paul, to Elf France. Cationic emulsions of bituminous binders of the bitumen type and their process of preparation. 4,576,648, Cl. 106-269.000.

DeMario, Edmund E., to Westinghouse Electric Corp. Partial grid for a nuclear reactor fuel assembly. 4,576,786, Cl. 376-439.000.

Deniega, Jose C.: *See—*
Montgomery, John R.; Brumaghim, Milton W.; and Deniega, Jose C., 4,576,166, Cl. 128-325.000.

Denison, Early B., to Shell Oil Company. Riser angle control apparatus and method. 4,576,516, Cl. 405-195.000.

Dennison National Company: *See—*
Beleckis, Vytautas K., 4,576,497, Cl. 402-73.000.

Denta, Edward P., Jr.: *See—*
Hedberg, David J.; Denta, Edward P., Jr.; and Jo Chiong, Victor E., 4,577,240, Cl. 360-22.000.

de Pierne, Otto S.: *See—*
Shukla, Jayendra G.; Sohn, Ki G.; Twickler, Carl; and de Pierne, Otto S., 4,576,612, Cl. 51-295.000.

Derain, Christian; and Saint-Marc, Henri R., to Societe Nouvelle des Bennes Saphem. Device for compacting contents of high capacity semitrailer body. 4,576,540, Cl. 414-511.000.

deRonde, Henry M., to United States of America, Air Force. Connecting coaxial cables to shielded electronic device. 4,577,054, Cl. 174-35.00C.

DeSoto, Inc.: *See—*
Crockatt, William B.; and Rimma, John, 4,576,987, Cl. 524-487.000.

Deters, Joseph C.: *See—*
Guittard, George V.; Deters, Joseph C.; Theeuwes, Felix; and Cortese, Richard, 4,576,604, Cl. 604-890.000.

Detroit Stoker Company: *See—*
Reschly, David C., 4,576,101, Cl. 110-182.500.

Deutsche Solvay Werke GmbH: *See—*
Kaeufer, Helmut; and Burr, August, 4,576,775, Cl. 264-323.000.

Deutsches Elektronen-Synchrotron Desy: *See—*
Rummler, Jurgen, 4,577,118, Cl. 307-106.000.

Deutschman, John E., to Alcan International Limited. Treatment of scrap lining material from aluminium reduction cells. 4,576,651, Cl. 134-25.100.

Development Finance Corporation of New Zealand: *See—*
Thorpe, Denis, 4,576,247, Cl. 181-243.000.

Devries, Luitzen: *See—*
Lam, Wim J.; Devries, Luitzen; McKinnon, Gordon M.; and Baribeau, Jean J., 4,576,577, Cl. 434-58.000.

Diamond, Harvey E. Integrated stereo and bathtub system II. 4,575,882, Cl. 4-559.000.

Dickinson, Harry D. Bollard trafficway barrier and vehicle arrest system. 4,576,508, Cl. 404-6.000.

Dickinson, Kay H.: *See—*
Crossley, Roger; and Dickinson, Kay H., 4,576,955, Cl. 514-335.000.

Diepers, Heinrich; Feigt, Ingmar; and Lange, Gottfried, to Siemens Aktiengesellschaft. X-Ray converter foil. 4,577,108, Cl. 250-370.000.

Diepstraten, Wilhelmus J. M.: *See—*
Boer, Jan; and Diepstraten, Wilhelmus J. M., 4,577,334, Cl. 375-97.000.

Diffracto Ltd.: *See—*
Pryor, Timothy R., 4,576,482, Cl. 356-376.000.

DiGianfilippo, Dominic J.: *See—*
Parker, Robert R.; and DiGianfilippo, Dominic J., 4,576,578, Cl. 434-307.000.

Digital Engineering, Ltd.: *See—*
Hedberg, David J.; Denta, Edward P., Jr.; and Jo Chiong, Victor E., 4,577,240, Cl. 360-22.000.

Dillon, Larry W.; Jamerson, Robert L.; and Padgett, Thomas M., to Fieldcrest Mills, Inc. Pile fabrics as woven terry fabrics with diagonal grooves of cut pile. 4,576,848, Cl. 428-89.000.

Dils, Ray R., to United States of America, Commerce. Optical fiber thermometer. 4,576,486, Cl. 374-131.000.

Dixon, Derek; and Richardson, Barry A., to John Brown Automation Limited. Apparatus for use in leak detection. 4,576,038, Cl. 73-40.700.

DMI Wireline, Inc.: *See—*
Brown, Robert L., 4,576,229, Cl. 166-177.000.

Dobhan, Herbert: *See—*
Brandenstein, Manfred; Walter, Lothar; Haas, Roland; and Dobhan, Herbert, 4,576,268, Cl. 192-98.000.

Dobner, Donald J., to General Motors Corporation. Power assisted braking system with wheel lock control. 4,576,417, Cl. 303-15.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Klie, Jurgen; and Nehl, Rainer, 4,577,219, Cl. 358-78.000.

Docutel/Olivetti Corporation: *See—*
Fulbright, Thomas G.; and Payne, G. Houson, III, 4,576,495, Cl. 400-328.000.

Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, to Fried. Krupp Gesellschaft mit beschraenkter Haftung. Process for the production of ferromanganese. 4,576,638, Cl. 75-80.000.

Doi, Isao; Mihashi, Takashi; and Yokota, Shoichiro, to Nissan Motor Co., Ltd. Valve timing control device for an internal combustion engine. 4,576,127, Cl. 123-90.150.

Dolby Laboratories Licensing Corporation: *See—*
Allen, Ioan R., 4,577,302, Cl. 369-46.000.
Allen, Ioan R.; and Todd, Craig C., 4,577,305, Cl. 369-86.000.

Domino Printing Sciences Plc: *See—*
Slomianny, Jan, 4,576,111, Cl. 118-313.000.

Donahue, Frederick A.: *See—*
Beery, Jack; Donahue, Frederick A.; and Shaul, Ronald E., 4,577,096, Cl. 250-205.000.

Donald, Dennis S., to Du Pont de Nemours, E. I., and Company. Tanning development in low silver photoimaging using polymeric couplers. 4,576,894, Cl. 430-264.000.

Donato, Anthony C.; and Kartavenko, Alex, to Lightolier Incorporated. Ceiling mounted lighting fixture with thermal protector. 4,577,266, Cl. 362-296.000.

Doncroft Colors & Chemicals, Inc.: *See—*
Donenfeld, Henry, 4,576,610, Cl. 8-471.000.

Dondero, John: *See—*
Dawson, Chris R.; Dondero, John; and Parks, Gerald R., 4,575,875, Cl. 2-422.000.

Donenfeld, Henry, to Doncroft Colors & Chemicals, Inc. Sublimation dye transfer printing of fabrics. 4,576,610, Cl. 8-471.000.

Donnelly, Thomas J.: *See—*
Ferree, Herbert E.; Wagner, Thomas R.; Hecht, Michael D.; and Donnelly, Thomas J., 4,577,127, Cl. 310-83.000.

Donofrio, Pat. Glass scriber assembly. 4,576,079, Cl. 83-886.000.

Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, to Toyota Jidosha Kabushiki Kaisha; and Art Kinzoku Kogyo Kabushiki Kaisha. Composite material and process for its production. 4,576,863, Cl. 428-325.000.

Dorrer, Bernhard; and Strametz, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of a polypropylene molding composition. 4,576,994, Cl. 525-247.000.

Doskocil Manufacturing Co., Inc.: *See*—
Frydenberg, Donald V., 4,576,307, Cl. 220-324.000.
Dove, Anna Lena: *See*—
Dove, Doublas J. A.; and Nelson, Raymond F., 4,576,280, Cl. 206-289.000.
Dove, Doublas J. A.; and Nelson, Raymond F., to Dove, Anna Lena. Hanging garment container. 4,576,280, Cl. 206-289.000.
Dow Chemical Company, The: *See*—
Coleman, William M., III; and Edmondson, Morris S., 4,577,001, Cl. 526-127.000.
Dai, Shenghong A.; and Sherwood, Philip W., 4,576,980, Cl. 523-420.000.
Durvasula, Visweswara R., 4,577,034, Cl. 549-241.000.
Ellerbe, Gilbert B., III; and Hefner, Robert E., Jr., 4,576,998, Cl. 525-455.000.
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,576,721, Cl. 210-640.000.
Dowling, Donald J.; and Palmer, Harold A., to Texaco Inc. Method and apparatus for combating encroachment by in situ treated formations. 4,576,231, Cl. 166-248.000.
Downs, Michael J. Apparatus and method for investigation of a surface. 4,576,479, Cl. 356-351.000.
Dreher, Gunther: *See*—
Stieber, Michael; Meinke, Peter; and Dreher, Gunther, 4,576,246, Cl. 180-168.000.
Dreibelbis, Richard C., to Emerson Electric Co. (H&H Precision Prod. Div.). Cartridge type control valve with inverted J-shaped inlet duct. 4,576,195, Cl. 137-315.000.
Dresser Industries, Inc: *See*—
Michaels, John M.; Croopnick, Gerald A.; and Morris, Richard A., 4,576,715, Cl. 210-347.000.
Dresser, Thomas M.: *See*—
Clements, Talmage B.; and Dresser, Thomas M., 4,576,785, Cl. 376-435.000.
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Drewes, John H.; and Gemra, Richard J., to Bell Communications Research, Inc. Guy hook. 4,575,904, Cl. 24-115.00K.
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Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.
Drogi, Dieter: *See*—
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, 4,577,200, Cl. 346-140.00R.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal oxime N-alkyl-N-α-haloacyl-carbamates. 4,576,965, Cl. 514-564.000.
DSM Resins B.V.: *See*—
Hupperetz, Willem J. H.; and Ramakers, Johannes A. H. M., 4,577,017, Cl. 544-193.000.
Dubroff, Seymour. Intraocular lenses. 4,575,878, Cl. 623-6.000.
Ducata Limited: *See*—
Delahunty, Michael D., 4,576,664, Cl. 156-71.000.
Duda, Henry J., to Randall Equipment Company. Awning assembly. 4,576,192, Cl. 135-89.000.
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., to Chevron Research Company. Non-condensible gas injection including alpha-olefin sulfonate dimer surfactant additives and a process of stimulating hydrocarbon recovery from a subterranean formation. 4,576,232, Cl. 166-274.000.
Duffy, Joseph K.: *See*—
Combs, Cathy M.; Duffy, Joseph K.; and Thoene, Mark, 4,576,017, Cl. 62-372.000.
Dufresne, Raymond A. Snap cable clamp apparatus for battery terminals. 4,576,430, Cl. 339-100.000.
Duggan, Jack, to Fire Detection Devices Ltd. Fire detector. 4,577,186, Cl. 340-589.000.
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Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., 4,576,148, Cl. 128-26.000.
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Pol, Vincent; and Dumas, Jean-Claude, 4,576,606, Cl. 623-3.000.
Duncombe, Edward; and Winstanley, John P., to United Kingdom Atomic Energy Authority. Temperature threshold detectors. 4,576,781, Cl. 376-247.000.
Duneman, Dennis C.: *See*—
Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., 4,577,103, Cl. 250-316.100.
Dunlop, Alfred E.; and Kernighan, Brian W., to AT&T Bell Laboratories. Placement of components on circuit substrates. 4,577,276, Cl. 364-491.000.
Dunlop Limited: *See*—
Cox, Andrew P. D., 4,576,037, Cl. 73-40.50R.
Dunn, Jeffery L.; and Durham, Michael W., to Leyman Manufacturing Corp. Safety latch for a cargo platform. 4,576,541, Cl. 414-545.000.
Du Pont de Nemours, E. I., and Company: *See*—
DeBergalis, Michael, 4,577,007, Cl. 526-321.000.
Donald, Dennis S., 4,576,894, Cl. 430-264.000.
Farnham, William B., 4,577,003, Cl. 526-194.000.
Gannett, Thomas P.; and Gibbs, Hugh H., 4,576,857, Cl. 428-260.000.
Krespan, Carl G., 4,576,752, Cl. 260-349.000.
Lemke, Timothy A., 4,576,662, Cl. 156-52.000.
Malhotra, Satish C., 4,576,869, Cl. 428-502.000.
Reap, James J., 4,576,633, Cl. 71-93.000.
Redick, Hugh E., 4,576,810, Cl. 423-447.100.
Riggs, Dennis M.; and Redick, Hugh E., 4,576,811, Cl. 423-447.200.
Rorer, Morris P., 4,576,632, Cl. 71-93.000.
Smith, Malcolm S.; and Daigle, Colastie J., 4,576,821, Cl. 426-1.000.
Wells, John R., 4,576,110, Cl. 118-52.000.
Wexler, Ruth R., 4,576,958, Cl. 514-400.000.
Duquesne , Jean F.; and Rozenwaig, Boris. Packet-based telecommunication system. 4,577,311, Cl. 370-60.000.
Durham, Michael W.: *See*—
Dunn, Jeffery L.; and Durham, Michael W., 4,576,541, Cl. 414-545.000.
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McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.
Durvasula, Visweswara R., to Dow Chemical Company, The. Autoxidation of bis(ortho dialkyl-phenoxy)benzophenones. 4,577,034, Cl. 549-241.000.
Dusza, John P.: *See*—
Tomcufcik, Andrew S.; Meyer, Walter E.; Dusza, John P.; and Tseng, Shin S., 4,576,943, Cl. 514-222.000.
Duwel, Edward E.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward E., 4,577,283, Cl. 364-464.000.
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Dynamit Nobel AG: *See*—
Matthes, Reinhard; and Vahlensieck, Hans-Joachim, 4,577,045, Cl. 568-851.000.
Dynascan Corporation: *See*—
Lulay, John R., 4,577,072, Cl. 179-175.10R.
Dzialas, Willi: *See*—
Krautter, Jurgen; and Dzialas, Willi, 4,576,864, Cl. 428-328.000.
E. R. Squibb & Sons, Inc.: *See*—
Zahler, Robert; Koster, William H.; and Slusarchyk, William A., 4,576,749, Cl. 260-239.00A.
E-Systems, Inc.: *See*—
Ballew, James D.; and Rogers, Phil H., 4,577,272, Cl. 364-200.000.
E-W Mold & Tool Company, Inc.: *See*—
Grannen, Walter A., III, 4,576,568, Cl. 425-577.000.
Eagle-Picher Industries, Inc.: *See*—
Cargould, Barry D., 4,576,040, Cl. 73-146.000.
Easter, Finis C.; and Aires, Ramon H., to RCA Corporation. Switching dc-to-dc converters. 4,577,268, Cl. 363-21.000.
Eastman Kodak Company: *See*—
Fletcher, George L., Jr.; Bender, Steven L.; and Wadsworth, Donald H., 4,577,024, Cl. 546-183.000.
Gunther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, 4,576,905, Cl. 430-401.000.
Howe, Dennis G.; and Wrobel, Joseph J., 4,577,306, Cl. 369-109.000.
Trotter, Jimmy R.; and McConnell, Richard L., 4,576,997, Cl. 525-444.000.
Eaton Corporation: *See*—
Bopp, Warren G., 4,576,259, Cl. 192-3.210.
Chambers, Worthy L.; Jones, William H.; and Hayden, Arthur H., 4,577,179, Cl. 340-309.150.
Howering, Robert, 4,576,535, Cl. 411-503.000.
Lane, E. James; Holmes, Russell C.; and Markyvech, Ronald K., 4,576,263, Cl. 192-0.044.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,577,052, Cl. 136-246.000.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,577,208, Cl. 357-23.400.
Speranza, Donald; Lane, E. James; and Markyvech, Ronald K., 4,576,065, Cl. 74-866.000.
Eaton, Ralph M.; and Geen, Michael W., to Plessey Overseas Limited. Diamond heatsink assemblies. 4,576,224, Cl. 165-80.200.
Ebbinghaus, Wilfried: *See*—
Steiner, Helmut; Ebbinghaus, Wilfried; and Paech, Hartmut, 4,576,488, Cl. 384-291.000.
Eberhard Faber, Inc.: *See*—
Nelson, John E., 4,576,424, Cl. 312-231.000.
Ebert, Charles, to Gebr. Happich GmbH. Sun visor with molded stiffening frame. 4,576,409, Cl. 296-97.00H.
EBM Elektrobau Mulfingen GmbH & Co.: *See*—
Reinhardt, Wilhelm; and Lipp, Helmut, 4,577,139, Cl. 318-254.000.
Ebnother, Martin: *See*—
Gale, Michael T.; Knop, Karl H.; and Ebnother, Martin, 4,576,439, Cl. 350-162.230.
Echigo, Yoshiaki; Suematsu, Yoshiyuki; and Ishikura, Tadashi, to Unitika Ltd. Spherical ion exchange resin having matrix-bound metal hydroxide, method for producing the same and method for adsorption treatment using the same. 4,576,969, Cl. 521-28.000.
Eckberg, Richard P., to General Electric Company. Ultraviolet radiation-curable silicone release compositions with epoxy and/or acrylic functionality. 4,576,999, Cl. 525-476.000.
Eckenrodt, Richard H. Rebar saddle. 4,575,985, Cl. 52-677.000.
Eckert, Alton B.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward E., 4,577,283, Cl. 364-464.000.
Eckhardt, David A.: *See*—
Lahoda, Edward J.; and Eckhardt, David A., 4,576,123, Cl. 122-382.000.

Eckhardt, Reiner: *See*—
Gauggel, Roland; and Eckhardt, Reiner, 4,576,346, Cl. 244-3.160.

Eddens, Fletcher C.; White, David W.; and Harmon, John L., to General Electric Company. Heat treated tube. 4,576,654, Cl. 148-11.50F.

Edmondson, Morris S.: *See*—
Coleman, William M., III; and Edmondson, Morris S., 4,577,001, Cl. 526-127.000.

Edwards, Robert J.; and Hardman, Paul D., to Lever Brothers Company. Detergent compositions. 4,576,744, Cl. 252-554.000.

Edwards, William E.: *See*—
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EECO Incorporated: *See*—
Pargee, Robert W., Jr., 4,577,191, Cl. 340-825.790.

Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Substituted hexahydrobenzo[e]indene and octahydrophenanthrene CNS agents and pharmaceutical compositions thereof. 4,576,964, Cl. 514-546.000.

Ehrlich, Paul; Anderson, Wayne A.; Kang, En T.; and Bhatt, Ansuya P., to Research Foundation of State University of New York, The. Photoconductive polymer compositions. 4,576,887, Cl. 430-71.000.

Eijnthoven, Ronald K.: *See*—
Scholten, Pieter C.; and Eijnthoven, Ronald K., 4,576,833, Cl. 427-67.000.

Eisai Co., Ltd.: *See*—
Kuriyama, Shizuo; and Saitoh, Mikio, 4,576,966, Cl. 514-648.000.
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.

Eisenberg, Bernard C., to Solbern Corp. Method and apparatus for delivering a predetermined amount of material to a container. 4,576,209, Cl. 141-1.000.

Eisenberg, Hans J. Portable platform trestle for stages, platforms, pedestals or the like. 4,575,975, Cl. 52-109.000.

Eisenlauer, Josef; Horn, Dieter; and Neuwirth, Manfred, to BASF Aktiengesellschaft. Estimation of the degree of dispersion in flowing concentrated dispersions. 4,576,723, Cl. 210-709.000.

Eitan, Boaz; Kolodny, Avi; Amrany, Daniel; and McCreary, James, to Intel Corporation. Hybrid E^2 cell and related array. 4,577,295, Cl. 365-218.000.

Electric Power Research Institute: *See*—
Glamm, Paul R.; and Wendschlag, James C., 4,576,011, Cl. 62-115.000.

Electricite de France: *See*—
Plard, Christian; and Soulie, Jacques, 4,577,093, Cl. 219-376.000.

Electrochemische Energieconversie N.V.: *See*—
Alfenaar, Marinus, 4,576,877, Cl. 429-12.000.

Electrovac Gesellschaft m.b.H.: *See*—
Bayer, Helmut, 4,577,176, Cl. 337-394.000.

Elf France: *See*—
Demangeon, Francis; Hagenbach, Germain; and Maldonado, Paul, 4,576,648, Cl. 106-269.000.

Eli Lilly and Company: *See*—
Flaugh, Michael E., 4,576,959, Cl. 514-411.000.
Lunn, William H. W.; and Vasileff, Robert T., 4,577,014, Cl. 544-022.000.

Elias, Abe G.; and Elias, Peter G. Device for squeezing and winding collapsible tubes. 4,576,314, Cl. 222-97.000.

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Elias, Abe G.; and Elias, Peter G., 4,576,314, Cl. 222-97.000.

Elleman, Daniel D.: *See*—
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,576,926, Cl. 502-339.000.

Ellerbe, Gilbert B., III; and Hefner, Robert E., Jr., to Dow Chemical Company, The. Vinyl urethane composite polymer containing vinyl terminated urethane oligomers. 4,576,998, Cl. 525-455.000.

El-Sadi, Ashraf I., to Memorex Corporation. Techniques for disk servo. 4,577,244, Cl. 360-77.000.

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Kassza, Tibor; Kakonyi, Gyula; and Molnar, Gabor, 4,576,025, Cl. 70-276.000.

Emerson Electric Co.: *See*—
Terpstra, Daniel A.; and Brundage, Richard B., 4,576,072, Cl. 83-102.100.

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Dreibelbis, Richard C., 4,576,195, Cl. 137-315.000.

Emkay Manufacturing Co.: *See*—
Kaplan, Alan; and Amato, James, 4,576,114, Cl. 118-720.000.

Emonet, Henri. Tool assembly and handle assembly therefor. 4,576,241, Cl. 173-162.00H.

Emura, Noriaki; Ariyoshi, Takashi; and Kato, Toshikazu, to Toyo Soda Manufacturing Co., Ltd. Process for producing a chloroprene polymer. 4,577,004, Cl. 526-204.000.

Engelhardt, Fritz: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.

English Electric Valve Company: *See*—
Menown, Hugh; and Knight, Raymond P., 4,577,138, Cl. 313-599.000.

Entreprise d'Equipements Mecaniques et Hydrauliques (E.M.H.): *See*—
Ghilardi, Jean P. R. F.; and Forget, Remi F., 4,576,387, Cl. 277-176.000.

EPI Resources Ltd.: *See*—
Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., 4,576,518, Cl. 405-205.000.

Epson Corporation: *See*—
Kawamura, Yoshikazu, 4,577,203, Cl. 346-140.00R.

Epstein, Moshe. Biopsy attachment for ultrasonic probe. 4,576,175, Cl. 128-660.000.

Erdmann, Hermann; and Ramaker, Hermann, to ERNO Raumfahrttechnik GmbH. Rescue equipment for submarine vehicles. 4,576,105, Cl. 114-333.000.

Erhardt, Werner; and Hieber, Udo, to Siemens Aktiengesellschaft. Electric capacitor with an excessive-pressure safety protection mechanism. 4,577,257, Cl. 361-272.000.

Erickson, Wayne K.: *See*—
Burgess, Kenneth W.; Bryant, William R.; and Erickson, Wayne K., 4,576,852, Cl. 428-171.000.

Ermeto Armaturen GmbH: *See*—
Kohnlechner, Rainer, 4,576,049, Cl. 73-706.000.

ERNO Raumfahrttechnik GmbH: *See*—
Erdmann, Hermann; and Ramaker, Hermann, 4,576,105, Cl. 114-333.000.

Erwin Sick GmbH Optik-Elektronik: *See*—
Lauer, Reinhard; and Hartmann, Werner, 4,576,047, Cl. 73-597.000.

Eschrich, Gerhard; Juhasz, Josef; and Schwab, Manfred, to Robert Bosch GmbH. Method and apparatus to convert an electrical value into a mechanical position by using an electromagnetic element subject to hysteresis. 4,577,143, Cl. 318-701.000.

Esselte Pendaflex Corporation: *See*—
Snider, Alan D.; Soporowski, Andrzej L.; and Herbst, Manfred O., 4,576,328, Cl. 229-1.50R.

Essex Group, Inc.: *See*—
Levine, Herbert R.; Gerrato, Stephen G.; and Poulin, Benoit L., 4,576,207, Cl. 138-177.000.

Etablissements les Fils d'Auguste Chomarat et Cie: *See*—
Fourezon, Andre , 4,576,858, Cl. 428-300.000.

Estes, Bay E., III: *See*—
Latasiewicz, Leonard; Melikian, Felix B.; and Estes, Bay E., III, 4,577,259, Cl. 361-400.000.

Ethyl Corporation: *See*—
Juneau, Matthew K., 4,576,806, Cl. 423-300.000.
Loechelt, Cecil P., II, 4,576,807, Cl. 423-329.000.

Etschenberg, Eugen: *See*—
Bauer, Kurt H.; Ghyczy, Miklos; Etschenberg, Eugen; and Osthoff, Heinrich, 4,576,626, Cl. 71-28.000.

Euroceltique, S.A.: *See*—
Shetty, Bola V., 4,576,818, Cl. 424-150.000.

Evans, Charles W.: *See*—
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Evans, Gary E., to Westinghouse Electric Corp. Microstrip line branching coupler having coaxial coupled remote termination. 4,577,167, Cl. 333-128.000.

EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Gesellschaft m.b.H. & Co. Kommanditgesellschaft: *See*—
Kurt, Prunbauer; and Csapo, Erich, 4,576,026, Cl. 70-380.000.

Excel Industries, Inc.: *See*—
Mariel, James G., 4,575,968, Cl. 49-502.000.

Excelermatic Inc.: *See*—
Kraus, Charles E., 4,575,910, Cl. 29-148.40D.
Kraus, Charles E., 4,576,055, Cl. 74-200.000.

Exxon Production Research Co.: *See*—
Mast, Robert F.; Cichanski, William J.; Walker, Francis R.; and Magura, Donald D., 4,576,519, Cl. 405-207.000.
Smetak, Edward C., 4,576,523, Cl. 405-227.000.

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Siskin, Michael; and Brons, Glen B., 4,576,707, Cl. 208-8.0LE.
Weber, Paul S., 4,576,404, Cl. 285-41.000.

Eyzaguirre, Ramon C. Closed chamber dryer. 4,575,951, Cl. 34-30.000.

Fafournoux, Bernard. Bag for vacuum packaging of articles. 4,576,283, Cl. 206-524.800.

FAG Kugelfischer Georg Schafer (KGaA): *See*—
Scharting, Gunter; and Neugebauer, Steffen, 4,576,382, Cl. 277-12.000.

Fairey Engineering Limited: *See*—
Chadwick, John R., 4,577,087, Cl. 219-121.0LC.

Faletti, Fred J.: *See*—
Willett, Richard A.; Faletti, Fred J.; and Faletti, Paul A., 4,575,986, Cl. 53-118.000.

Faletti, Paul A.: *See*—
Willett, Richard A.; Faletti, Fred J.; and Faletti, Paul A., 4,575,986, Cl. 53-118.000.

Falk, Robert A., to Ciba-Geigy Corporation. Perfluoroalkyl-alkyl-thio, sulfinyl or sulfonyl-alkylene glycidyl ether. 4,577,036, Cl. 549-556.000.

Fanuc Ltd.: *See*—
Inaba, Hajimu; and Torii, Nobutoshi, 4,576,537, Cl. 414-222.000.

Farge, Daniel: *See*—
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Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,577,016, Cl. 544-182.000.
Valentini, Luigi; and Coccia, Mario, 4,576,211, Cl. 141-329.000.

Farnham, William B., to Du Pont de Nemours, E. I., and Company. Pentacoordinate silyl enolates and their use as polymerization initiators. 4,577,003, Cl. 526-194.000.

Farrelly, Susan E.; and Spector, George. Process of forming a labeled tag for a garment. 4,576,668, Cl. 156-93.000.
Farrington, Richard I.: *See—*
Amici, Francis R.; Berger, Hans S.; Farrington, Richard I.; and Piazza, Pietro, 4,576,586, Cl. 446-315.000.
Fasel, Herman P.: *See—*
Kapur, Jagdish C.; and Fasel, Herman P., 4,576,754, Cl. 260-245.20R.
Faul, Wolfgang; Furst, Leander; Holzer, Walter; and Kastening, Bertel, to Kernforschungsanlage Julich GmbH. Method and apparatus for regenerating an ammoniacal etching solution. 4,576,677, Cl. 156-642.000.
Favara, Duccio; Omodei-Sale', Amedeo; and Consonni, Pietro, to Gruppo Lepetit, S.p.A. Novel β-lactam acetic acid derivatives. 4,576,746, Cl. 260-239.00A.
Fazekas, Carl F., to Panavision, Inc. Dual motor reversible drive film magazine. 4,576,455, Cl. 352-78.00R.
Fedosov, Alexei Z.: *See—*
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.
Fee, David M.: *See—*
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Feierabend, Louis: *See—*
Mottram, William R.; Fisher, Gene A.; and Feierabend, Louis, 4,576,616, Cl. 55-68.000.
Feigt, Ingmar: *See—*
Diepers, Heinrich; Feigt, Ingmar; and Lange, Gottfried, 4,577,108, Cl. 250-370.000.
Feldman, David B.: *See—*
Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., 4,577,197, Cl. 346-75.000.
Felthuis, Jacob; and Tournier, Joseph H., to Hoogovens Groep B.V.; and Keralox B.V. Ceramic sealing rope. 4,576,081, Cl. 87-6.000.
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Fennesz, Manfred. System for tempering a room. 4,576,221, Cl. 165-49.000.
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Meier, Jacques, 4,575,988, Cl. 53-399.000.
Ferderber, Fred F. Drawing support and storage apparatus. 4,576,279, Cl. 206-225.000.
Ferguson, Glenn R.; and Ferguson, Kenneth R. Horse wind and mud deflector. 4,575,996, Cl. 54-80.000.
Ferguson, Kenneth R.: *See—*
Ferguson, Glenn R.; and Ferguson, Kenneth R., 4,575,996, Cl. 54-80.000.
Ferguson Manufacturing, Inc.: *See—*
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Ferrar, Carl M.: *See—*
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Ferree, Herbert E.; Klinvex, Daniel E.; and Vestovich, Robert P., to Westinghouse Electric Corp. Adjustable radius apparatus for calibrating ultrasonic transducer array. 4,576,034, Cl. 73-1.0DV.
Ferree, Herbert E.; and Wagner, Thomas R., to Westinghouse Electric Corp. Core barrel plug. 4,576,778, Cl. 376-203.000.
Ferree, Herbert E.; Wagner, Thomas R.; Hecht, Michael D.; and Donnelly, Thomas J., to Westinghouse Electric Corp. Lightweight electric robotic actuator. 4,577,127, Cl. 310-83.000.
Ferro Corporation: *See—*
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Ferro, Gregory A.: *See—*
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Ferro Manufacturing Corporation: *See—*
Bickerstaff, David J., 4,575,967, Cl. 49-211.000.
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Fiberglas Canada, Inc.: *See—*
Lunt, James; MacPherson, Edwin J.; and Meunier, Paul J., 4,576,972, Cl. 521-136.000.
Fiddian-Green, Richard G. Intraluminal membrane oxygenator method for a tubular organ of the gastrointestinal tract. 4,576,590, Cl. 604-26.000.
Fieldcrest Mills, Inc.: *See—*
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Mills, Edwin R., 4,577,094, Cl. 219-505.000.
Fields, James R.; Rogers, Elmer H., Jr; and King, Larry K., to Aluminum Company of America. Separation of volatile impurities from aluminum chloride before electrolysis. 4,576,690, Cl. 204-67.000.
Fifolt, Michael J.: *See—*
Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,577,044, Cl. 568-677.000.
Figge, Dieter: *See—*
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,576,218, Cl. 164-431.000.
Figueredo, Jorge H., to Burroughs Corporation. Machine for ultrasonically bonding wires to cavity-down integrated circuit packages. 4,576,322, Cl. 228-4.500.
Filia, Philip J.: *See—*
Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., 4,576,148, Cl. 128-26.000.
Fink, Mathias A.; and Cardoso, Jean-Francois, to U.S. Philips Corporation. Device for the examination of objects by means of ultrasound echography. 4,576,046, Cl. 73-631.000.
Fink, Roland; Mayr, Maximilian; and Schlenz, Dieter, to Alkor GmbH Kunststoffe. Foam laminate foil or web and process for preparing same. 4,576,860, Cl. 428-314.400.
Finnieston, Alan: *See—*
Zagorski, Joseph; and Finnieston, Alan, 4,576,153, Cl. 128-87.00R.
Fire Detection Devices Ltd.: *See—*
Duggan, Jack, 4,577,186, Cl. 340-589.000.
Fischbach, Wolfgang, to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik. Handle attachment for a hollow accessory handle which is formed of sheet metal. 4,575,897, Cl. 16-110.00A.
Fischer, Udo K. R.: *See—*
Olsson, Olle G.; Yaman, Melih; Waldenstrom, Mats G.; and Fischer, Udo K. R., 4,576,875, Cl. 428-627.000.
Fisher, Gene A.: *See—*
Mottram, William R.; Fisher, Gene A.; and Feierabend, Louis, 4,576,616, Cl. 55-68.000.
Fitch, Robert C.; and Narendra, Pat M., to Honeywell Inc. Synthetic d.c. restoration of a.c. coupled signals. 4,577,223, Cl. 358-113.000.
Fitzgerald, Fitz E. Pipe cutter and method. 4,576,070, Cl. 82-82.000.
Fitzner, Klaus: *See—*
Mathewes, Wolfgang; Fitzner, Klaus; and Plitt, Uwe, 4,576,088, Cl. 98-119.000.
Flachenecker, Gerhard: *See—*
Schmidt, Alfred; and Flachenecker, Gerhard, 4,577,140, Cl. 318-587.000.
Flaugh, Michael E., to Eli Lilly and Company. 6-Substituted-4-dialkylaminotetrahydrobenz[c,d]indoles. 4,576,959, Cl. 514-411.000.
Flensburg, Carl G. A.; and Isaksson, Rolf H. V. Method in producing stitched printed matters and feeder for working the method. 4,576,369, Cl. 270-54.000.
Fletcher, George L., Jr.; Bender, Steven L.; and Wadsworth, Donald H., to Eastman Kodak Company. Oxoindolizine and oxoindolizinium compounds useful as dyes. 4,577,024, Cl. 546-183.000.
Floreancig, Antoine, to Uranium Pechiney Ugine Kuhlmann. Method of dissolving impure uranium tetrafluoride. 4,576,802, Cl. 423-20.000.
Florida State University: *See—*
Lipner, Harry, 4,576,599, Cl. 604-390.000.
Fluorocarbon/Sepco: *See—*
Kana, Kenneth W.; Kana, Willie H.; and Seidel, Francis L., 4,575,917, Cl. 29-520.000.
FMC Corporation: *See—*
Anderson, David N., 4,576,562, Cl. 425-126.00S.
Post, Steven W., 4,576,337, Cl. 239-127.000.
Ungchusri, Tep; and Jakubowski, William J., 4,576,385, Cl. 277-124.000.
Foerster, Peter: *See—*
Maack, Werner; Kampfmann, Georg; and Foerster, Peter, 4,576,032, Cl. 72-431.000.
Foglio, Maurizio: *See—*
Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,577,016, Cl. 544-182.000.
Fontaine, Guy; and Achard, Serge, to Promocab, S.A. Apparatus for the protection of places such as residences. 4,577,183, Cl. 340-541.000.
Force, Louis W. Wellhead gas treatment and co-generation method and system. 4,576,005, Cl. 60-618.000.
Forget, Remi F.: *See—*
Ghilardi, Jean P. R. F.; and Forget, Remi F., 4,576,387, Cl. 277-176.000.
Forrer, Hans. Multipurpose clamping device for workpieces, particularly of wood. 4,576,529, Cl. 408-240.000.
Forrest, Stephen R.; and Panock, Richard L., to AT&T Bell Laboratories. Photodiodes having a hole extending therethrough. 4,577,209, Cl. 357-30.000.
Forse, Nicholas J. A.: *See—*
Johnston, Robert D.; and Forse, Nicholas J. A., 4,577,071, Cl. 179-170.200.
Forster, Hilmar, to Scharfenbergkupplung GmbH. Vehicle coupler device having means for taking excess impacts. 4,576,294, Cl. 213-9.000.
Fortuna, Vincent E., to Vercon, Inc. Apparatus for closing a container. 4,575,987, Cl. 53-298.000.
Foster, John L. Pipeline inspection vehicles. 4,576,097, Cl. 104-138.00G.
Foster, Pierce W.: *See—*
Robinson, Joseph G.; and Foster, Pierce W., 4,577,009, Cl. 528-228.000.
Foster, Robert D., to Spred-A-Bag Inc. Dispensing bag. 4,576,316, Cl. 222-541.000.
Fourezon, Andre , to Etablissements les Fils d'Auguste Chomarat et Cie. Material based on a non-woven textile lap which may be used as reinforcement for impermeable coverings. 4,576,858, Cl. 428-300.000.
Franceschi, Giovanni: *See—*
Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,577,016, Cl. 544-182.000.
Frank, Gerald L.: *See—*
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,576,194, Cl. 137-84.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,576,095, Cl. 104-12.000.
Theurer, Josef; and Brunninger, Manfred, 4,576,538, Cl. 414-339.000.

Freedman, Larry A.: *See—*
Rentsch, Edward M.; and Freedman, Larry A., 4,577,115, Cl. 250-578.000.
Freeman, Tommie A., to Halliburton Company. Rupturable closure. 4,576,522, Cl. 405-225.000.
Freimiller, Gary L.: *See—*
Tyrell, John A.; and Freimiller, Gary L., 4,576,982, Cl. 524-84.000.
Frerichs, Klaus-Dieter: *See—*
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, 4,577,200, Cl. 346-140.00R.
Fres-co System USA, Inc.: *See—*
Goglio, Luigi, 4,576,285, Cl. 206-632.000.
Frey, Alan E.; and Kerr, Howard A., to AT&T Bell Laboratories. Meet-me conference arrangement. 4,577,065, Cl. 179-18.0BC.
Frey, Otto: *See—*
Muller, Maurice E.; and Frey, Otto, 4,576,152, Cl. 128-92.00R.
Fricker, Urs: *See—*
Martin, Henry; and Fricker, Urs, 4,576,628, Cl. 71-88.000.
Fried. Krupp Gesellschaft mit beschraenkter Haftung: *See—*
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,576,218, Cl. 164-431.000.
Friedrich Vollmer Fienmessgeratebau GmbH: *See—*
Rigler, Gunter; and Vollmer, Friedrich, 4,575,945, Cl. 33-182.000.
Frito-Lay, Inc.: *See—*
Socola, Helen M.; and Topor, Michael G., 4,576,108, Cl. 118-19.000.
Frommer, Elmar: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,576,804, Cl. 423-265.000.
Frosien, Jurgen; and Pomper, Michael, to Siemens Aktiengesellschaft. Arrangement and method for voltage measurement at a buried test subject. 4,577,147, Cl. 324-71.300.
Fryberg, Mario; Schaller, Heinrich; Steiger, Rolf; and Peter, Heinz, to Ciba-Geigy AG. Photographic material for the silver dye bleach process. 4,576,885, Cl. 430-390.000.
Frydenberg, Donald V., to Doskocil Manufacturing Co., Inc. Separable elements held together by a sliding latch. 4,576,307, Cl. 220-324.000.
Fuchs, Hermann: *See—*
Mischke, Peter; and Fuchs, Hermann, 4,576,755, Cl. 260-245.780.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,576,061, Cl. 74-665.00T.
Fuji Machinery Company, Ltd.: *See—*
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,576,588, Cl. 493-475.000.
Fuji Micro Graphics Co., Ltd.: *See—*
Shiga, Koji; and Arito, Tatsunari, 4,576,469, Cl. 355-29.000.
Fuji Photo Film Co., Ltd.: *See—*
Akao, Mutsuo, 4,576,865, Cl. 428-335.000.
Araki, Hiroaki; and Kitamoto, Tatsuji, 4,576,635, Cl. 75-0.5AA.
Cho, Michio; Suzuki, Masane; and Saito, Takayuki, 4,576,458, Cl. 354-199.000.
Hirano, Tsumoru; and Furutachi, Nobuo, 4,576,910, Cl. 430-548.000.
Hirokazu, Sakaki; and Takizawa, Kazushige, 4,576,686, Cl. 204-33.000.
Hosoi, Noriyuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,576,831, Cl. 427-40.000.
Hosoi, Noriyuki, 4,576,890, Cl. 430-137.000.
Kawamata, Toshio, 4,577,077, Cl. 219-10.430.
Kita, Nobuyuki; and Matsumoto, Hiroshi, 4,576,743, Cl. 252-524.000.
Kogane, Mikio; and Nishimura, Mizuho, 4,576,471, Cl. 355-50.000.
Kogane, Mikio; Nishimura, Mizuho; and Yamamoto, Takashi, 4,576,473, Cl. 355-68.000.
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,576,893, Cl. 430-457.000.
Okita, Tsutomu; Tsuji, Nobuo; and Mukaida, Yoshito, 4,576,866, Cl. 428-336.000.
Shiga, Koji; and Arito, Tatsunari, 4,576,469, Cl. 355-29.000.
Shiraishi, Atsushi; and Nishimura, Mizuho, 4,576,474, Cl. 355-75.000.
Takahashi, Osamu; and Sakai, Minoru, 4,576,906, Cl. 430-497.000.
Fuji Xerox Co., Ltd.: *See—*
Kurata, Masami, 4,577,218, Cl. 358-75.000.
Takahashi, Koji; and Mochizuki, Akira, 4,576,371, Cl. 271-296.000.
Fujii, Makoto: *See—*
Kambara, Goro; and Fujii, Makoto, 4,576,113, Cl. 118-697.000.
Fujii, Masahiro: *See—*
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,576,716, Cl. 210-496.000.
Fujikawa, Junichi; Togashi, Osamu; and Kashio, Shigetra, to Toray Industries, Incorporated. Process of making a polyamide printing plate having an improved contact with an image-bearing film. 4,576,897, Cl. 430-273.000.
Fujikawa, Takashi: *See—*
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,576,680, Cl. 162-158.000.
Fujikawa, Takeshi: *See—*
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.
Fujimori, Noboru: *See—*
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Organoleptic tertiary hydroxyl carboxaldehydes. 4,576,739, Cl. 252-522.00R.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Hashimoto, Masashi; and Nakaguti, Osamu, 4,576,753, Cl. 260-239.00A.
Fujita, Takayuki; Kitazawa, Yoshikazu; Akita, Tadashi; and Tani, Isamu. 1-Benzoyldibromomethyl-2-methylimidazole as a fungicidal agent. 4,577,032, Cl. 548-341.000.
Fujita, Tsuyoshi: *See—*
Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, 4,576,735, Cl. 252-512.000.
Fujitsu Limited: *See—*
Kanbara, Kazuhiro; and Hataishi, Osamu, 4,575,925, Cl. 29-576.00W.
Sano, Yoshiaki; Omura, Isamu; and Hiramatsu, Ryo, 4,577,121, Cl. 307-355.000.
Fujiwara, Shunji: *See—*
Miyake, Hidenori; Fujiwara, Shunji; Nakazato, Yoshio; Yanagishima, Fumiya; and Teshiba, Toko, 4,576,029, Cl. 72-205.000.
Fukasawa, Yoshiro; Fukazawa, Tomoyuki; and Kawamura, Michihiro, to Japan Spectroscopic Co., Ltd. Spectrophotometer. 4,577,106, Cl. 250-347.000.
Fukazawa, Tomoyuki: *See—*
Fukasawa, Yoshiro; Fukazawa, Tomoyuki; and Kawamura, Michihiro, 4,577,106, Cl. 250-347.000.
Fukuchi, Masakazu; and Oishi, Keiji, to Konishiroku Photo Industry Co., Ltd. Developing system for an electrostatic copying apparatus. 4,576,466, Cl. 355-3.0DD.
Fukuda, Hiroya: *See—*
Oyachi, Tomio; Fukuda, Hiroya; and Anami, Masahiko, 4,576,859, Cl. 428-311.100.
Fukuda, Shinichi, to Sony Corporation. Digital data converting method and apparatus thereof. 4,577,180, Cl. 340-347.0DD.
Fukuda, Tsuyoshi; and Aihara, Yoshihiko, to Canon Kabushiki Kaisha. Motor driven winding mechanism for camera. 4,576,457, Cl. 354-173.110.
Fukui, Masayuki: *See—*
Kobayashi, Hiroyasu; Fukui, Masayuki; and Nomoto, Shosaku, 4,576,672, Cl. 156-177.000.
Fukunaga, Yasuo: *See—*
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Fukushima, Masao: *See—*
Yamasaki, Masahiro; Hirose, Iwao; Fukushima, Masao; and Yoshida, Ichiro, 4,576,467, Cl. 355-10.000.
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toshiba. Method for controlling the operation of a microwave-excited oxygen plasma surface treatment apparatus. 4,576,692, Cl. 204-165.000.
Fulbright, Thomas G.; and Payne, G. Houson, III, to Docutel/Olivetti Corporation. Depository/printer mechanism for an automated teller machine. 4,576,495, Cl. 400-328.000.
Fullinwider, Ranson R.: *See—*
Tapp, William T.; and Fullinwider, Ranson R., 4,576,230, Cl. 166-382.000.
Fulton, Robert D.: *See—*
Hilleary, Thomas N.; and Fulton, Robert D., 4,577,062, Cl. 179-2.00A.
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, to Kusters, Eduard. Device for applying a treatment medium, especially in foam form, to a running web of material. 4,576,112, Cl. 118-415.000.
Furst, Leander: *See—*
Faul, Wolfgang; Furst, Leander; Holzer, Walter; and Kastening, Bertel, 4,576,677, Cl. 156-642.000.
Furukawa, Kenji: *See—*
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
Furukawa, Yuzo: *See—*
Nakabayashi, Masamitsu; Furukawa, Yuzo; and Tashiro, Akira, 4,576,995, Cl. 525-285.000.
Furutachi, Nobuo: *See—*
Hirano, Tsumoru; and Furutachi, Nobuo, 4,576,910, Cl. 430-548.000.
Furutani, Satoshi: *See—*
Sugiyama, Tohru; Suzuki, Yasuo; Katagiri, Katsumasa; and Furutani, Satoshi, 4,576,930, Cl. 514-23.000.
Fushida, Akira; Hasegawa, Yuuji; and Matsui, Toshikazu, to Mita Industrial Co., Ltd. Method and apparatus for adjusting toner concentration of two-component type developer. 4,576,465, Cl. 355-3.0DD.
Futamura, Shoji: *See—*
Yoda, Yasutada; Sucyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, 4,576,559, Cl. 425-28.00R.
Futatsumori, Koji: *See—*
Arai, Masatoshi; Futatsumori, Koji; Inoue, Takeo; and Sato, Shinichi, 4,577,041, Cl. 556-446.000.
Fuwa, Yoshio: *See—*
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GA Technologies Inc.: *See—*
Koutz, Stanley L., 4,576,783, Cl. 376-323.000.
Gaenzler, Wolfgang: *See—*
Baumgartner, Ehrenfried; Besecke, Siegmund; and Gaenzler, Wolfgang, 4,576,971, Cl. 521-108.000.
Gaertner, Dietrich: *See—*
Schwanitz, Manfred; Gaertner, Dietrich; Dressler, Wolfgang; and Schenk, Joerg, 4,577,195, Cl. 343-702.000.
Gagarin, Mikhail A.: *See—*
Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N., 4,576,824, Cl. 426-241.000.
Gahn, Randall F., to United States of America, National Aeronautics and Space Administration. Method and apparatus for rebalancing a redox flow cell system. 4,576,878, Cl. 429-15.000.
Gale, Michael T.; Knop, Karl H.; and Ebnother, Martin, to RCA Corporation. Reflective diffractive authenticating device. 4,576,439, Cl. 350-162.230.
Gall, Martin, to Upjohn Company, The. Aminoalkyl and aminoalkenyl triazoles as anti-psychotic agents. 4,577,020, Cl. 544-366.000.
Gallagher, James P.; and Schmidt, Howard W., Jr., to International Business Machines Corporation. Plasma etch cleaning in low pressure chemical vapor deposition systems. 4,576,698, Cl. 204-192.00E.
Gallas, Gerard; Raher, Loic; and Renzo, Bernard, to Compagnie des Produits Industriels de l'Quest (C.P.I.O.). Antivibration elastic support. 4,576,366, Cl. 267-8.00R.
Galuskin, Vadim B.: *See—*
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.
Gamble, William E. Object securing sleeve for padlock devices. 4,576,022, Cl. 70-55.000.
Gannett, Thomas P.; and Gibbs, Hugh H., to Du Pont de Nemours, E. I., and Company. Melt-fusible polyimides. 4,576,857, Cl. 428-260.000.
Ganster, Otto; Knipp, Ulrich; and Luckas, Bruno, to Bayer Aktiengesellschaft. Process for the production of molded articles having integral skin. 4,576,970, Cl. 521-51.000.
Garber, Gary L.; and Allhands, Marcus N., to A. O. Smith Harvestore Products, Inc. Livestock feeding apparatus. 4,576,117, Cl. 119-52.00B.
Garden City Fan & Blower Co.: *See—*
Lanier, Robert L., 4,576,549, Cl. 415-209.000.
Gardenier, Karl-Josef; and Heimbuerger, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Aqueous release agents. 4,576,835, Cl. 427-222.000.
Gardiner, Richard J., to Hercules Incorporated. Curved composite beam. 4,576,849, Cl. 428-119.000.
Garrett Corporation, The: *See—*
Olivier, Paul D.; and Chadbourne, Lester E., deceased, 4,576,551, Cl. 416-191.000.
Gauggel, Roland; and Eckhardt, Reiner, to Bodenseewerk Geratetechnic GmbH. Seeker head for a target seeking missile. 4,576,346, Cl. 244-3.160.
Gauldin, Mark A.: *See—*
Bimonte, Brian R.; Gauldin, Mark A.; and Riley, Douglas H., 4,577,066, Cl. 179-18.00B.
Gault, John M., to International Rectifier Corporation. Controlled rectifier having ring gate with internal protrusion for dV/dt control. 4,577,210, Cl. 357-38.000.
Gault, Robert: *See—*
Wright, Paul C.; and Gault, Robert, 4,576,329, Cl. 229-41.00R.
Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Specialities Chimiques. Preparation of alkali or alkaline earth metal cobalttetracarbonylates and catalysts of carbonylation reactions therewith. 4,576,809, Cl. 423-418.000.
Gauvain, Roger, to Societe Alsacienne de Construction de Material Textile. Device for guiding a sliver into a can coiler. 4,575,903, Cl. 19-159.00R.
Gaylor, Lawrence A.; and Beard, James W., to Mogul Corporation, The. Scale and sludge compositions for aqueous systems. 4,576,722, Cl. 210-699.000.
Gazzarrini, Vinicio, to Solis s.r.l. Pantyhose crotch edge stretching apparatus and method. 4,576,318, Cl. 223-52.000.
Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., to United States of America, Air Force. Method and apparatus for high speed, sustained recording of infrared laser beam patterns. 4,577,103, Cl. 250-316.100.
Gebbia, Barbara: *See—*
Paszek, Leon E.; and Gebbia, Barbara, 4,576,729, Cl. 252-106.000.
Gebr. Happich GmbH: *See—*
Ebert, Charles, 4,576,409, Cl. 296-97.00H.
GEE Associates: *See—*
Grossman, M. Gary, 4,577,080, Cl. 219-10.55E.
Gee, James E., to Caterpillar Tractor Co. Material directing device for an auger scraper. 4,575,959, Cl. 37-4.000.
Geen, Michael W.: *See—*
Eaton, Ralph M.; and Geen, Michael W., 4,576,224, Cl. 165-80.200.
Geis, Michael W.: *See—*
Smith, Henry I.; Atwater, Harry A.; and Geis, Michael W., 4,576,676, Cl. 156-603.000.
Gellert, Jobst U. Injection molding system having an insulation sleeve. 4,576,567, Cl. 425-549.000.
Gemra, Richard J.: *See—*
Drewes, John H.; and Gemra, Richard J., 4,575,904, Cl. 24-115.00K.
General Electric Company: *See—*
Brenig, Theodore, 4,577,332, Cl. 375-40.000.
Bryans, Alexander C., 4,576,550, Cl. 415-211.000.
Cooper, Glenn D., deceased; and Ting, Sai-Pei, 4,576,991, Cl. 525-146.000.
Eckberg, Richard P., 4,576,999, Cl. 525-476.000.
Eddens, Fletcher C.; White, David W.; and Harmon, John L., 4,576,654, Cl. 148-11.50F.
Hodge, James D., 4,576,919, Cl. 501-9.000.
Hodgman, John S.; and Mullersman, Ferdinand H., 4,577,144, Cl. 320-2.000.
Mark, Victor; and Hedges, Charles V., 4,576,996, Cl. 525-439.000.
Miller-Jones, Stockton M., 4,576,045, Cl. 73-626.000.
Mullersman, Ferdinand H., 4,577,145, Cl. 320-2.000.
Rowe, Raymond G., 4,576,660, Cl. 148-407.000.
Schultz, Frederick E., 4,576,770, Cl. 264-103.000.
Taylor, Dale F.; and Sammler, Louis S., 4,576,667, Cl. 156-89.000.
Verbicky, John W., Jr.; and Colley, Alice M., 4,577,033, Cl. 548-461.000.
General Motors Company: *See—*
Tyrell, John A.; and Freimiller, Gary L., 4,576,982, Cl. 524-84.000.
General Motors Corporation: *See—*
Bhagat, Jayant K., 4,575,921, Cl. 29-571.000.
Dobner, Donald J., 4,576,417, Cl. 303-15.000.
Gloomis, Lawrence A.; and Schoof, Wendy M., 4,575,908, Cl. 24-650.000.
Griffin, Michael D.; and Waydelis, Ronald A., 4,576,762, Cl. 261-65.000.
Herman, Edmund A., 4,576,560, Cl. 425-103.000.
Herrmann, Alan J., 4,576,426, Cl. 339-17.00F.
Klomp, Edward D., 4,576,338, Cl. 239-452.000.
Lambert, David K., 4,576,050, Cl. 73-861.050.
Lambert, George F., 4,576,407, Cl. 294-97.000.
LeBlanc, Richard S., 4,576,085, Cl. 89-36.130.
Partin, Dale L., 4,577,322, Cl. 372-44.000.
Shaw, Daniel, 4,576,217, Cl. 164-130.000.
Spisak, Andrew M.; and Adduci, Robert L., 4,576,258, Cl. 188-299.000.
Genrich, Thad J.: *See—*
Sperr, Charles J.; Sperr, Douglas C.; and Genrich, Thad J., 4,576,013, Cl. 62-171.000.
Geo Vann, Inc.: *See—*
George, Flint R., 4,576,233, Cl. 166-297.000.
George, Flint R., to Geo Vann, Inc. Differential pressure actuated vent assembly. 4,576,233, Cl. 166-297.000.
Geotel, Inc.: *See—*
Walker, Frank A., Jr., 4,576,828, Cl. 427-34.000.
Gerber Products Company: *See—*
Quinlan, Robert L., Jr., 4,576,392, Cl. 280-87.02W.
Gerrato, Stephen G.: *See—*
Levine, Herbert R.; Gerrato, Stephen G.; and Poulin, Benoit L., 4,576,207, Cl. 138-177.000.
Gerritsen, John T., to Jarrow Products, Inc. Magnetically sealed sliding window assembly. 4,575,966, Cl. 49-209.000.
Gerstner, Michael. Rollable pallet assembly and caster device. 4,576,391, Cl. 280-79.10R.
Ghilardi, Jean P. R. F.; and Forget, Remi F., to Entreprise d'Equipements Mecaniques et Hydrauliques (E.M.H.). Rotary joint device with floating seal ring for a cryogenic fluid. 4,576,387, Cl. 277-176.000.
Ghyczy, Miklos: *See—*
Bauer, Kurt H.; Ghyczy, Miklos; Etschenberg, Eugen; and Osthoff, Heinrich, 4,576,626, Cl. 71-28.000.
Gibbs, Hugh H.: *See—*
Gannett, Thomas P.; and Gibbs, Hugh H., 4,576,857, Cl. 428-260.000.
Giben Impianti S.p.A.: *See—*
Benuzzi, Gino, 4,576,536, Cl. 414-51.000.
Gieschen, Kurt: *See—*
Schwieker, Horst H.; and Gieschen, Kurt, 4,577,341, Cl. 378-150.000.
Gill, Brian: *See—*
Pinnow, Curtis C.; and Gill, Brian, 4,576,425, Cl. 312-324.000.
Gill, Elmer J.: *See—*
Christy, Arthur E.; and Gill, Elmer J., 4,577,284, Cl. 364-513.000.
Gillette Company, The: *See—*
Packham, Charles C., 4,575,941, Cl. 30-346.510.
Gilvin, Allie F.: *See—*
Laiewski, Stanislaus; Hessen, Thomas A.; Hardy, Thomas R.; and Gilvin, Allie F., 4,576,278, Cl. 206-204.000.
Gipson, Stephen L.: *See—*
Collins, Terrence J.; Anson, Fred C.; Gipson, Stephen L.; and Krafft, Terry E., 4,577,042, Cl. 564-158.000.
Gist-Brocades N.V.: *See—*
Kapur, Jagdish C.; and Fasel, Herman P., 4,576,754, Cl. 260-245.20R.
Glamm, Paul R.; and Wendschlag, James C., to Electric Power Research Institute. Air conditioning system and method of operation. 4,576,011, Cl. 62-115.000.
Glatthorn, Raymond H., to United States of America, Energy. Camcontrolled boring bar. 4,576,068, Cl. 82-1.400.
Glatthorn, Raymond H., to United States of America, Energy. Minimum wear tube support hole design. 4,576,228, Cl. 165-162.000.
Glenn, William E., to New York Institute of Technology. Method and apparatus for ultrasonic inspection of a solid workpiece. 4,576,048, Cl. 73-642.000.

Glockner, Manfred: *See*—
Wallenfang, Gerd; and Glockner, Manfred, 4,576,129, Cl. 123-357.000.

Gloomis, Lawrence A.; and Schoof, Wendy M., to General Motors Corporation. Lock for seat belt buckle. 4,575,908, Cl. 24-650.000.

Goffredo, Daniel L.; Meyer, Walter J.; and Blaising, Horst, to Schering AG. Process and apparatus for plating onto articles. 4,576,685, Cl. 204-30.000.

Goglio, Luigi, to Fres-co System USA, Inc. Sealed flexible container with non-destructive peelable opening and apparatus and method for forming same. 4,576,285, Cl. 206-632.000.

Golan, Leonard W.: *See*—
Rogak, Michael; Golan, Leonard W.; Witbeck, Charles; and Golan, Stephen L., 4,575,962, Cl. 42-1.00Q.

Golan, Stephen L.: *See*—
Rogak, Michael; Golan, Leonard W.; Witbeck, Charles; and Golan, Stephen L., 4,575,962, Cl. 42-1.00Q.

Golda, Eugene; and Wilkes, Alan, to Polychrome Corporation. Photosensitive materials. 4,576,892, Cl. 430-157.000.

Goldberg, Julie E.: *See*—
Hyman, Alan A.; and Goldberg, Julie E., 4,576,154, Cl. 128-78.000.

Golden, Steven T.: *See*—
Villaveces, James; and Golden, Steven T., 4,576,389, Cl. 280-43.160.

Goldmann, Wolf, to Krupp Polysius AG. Method of producing cement from raw material containing harmful substances. 4,576,644, Cl. 106-100.000.

Gondo, Hisashi: *See*—
Suzuki, Ryoichi; Ohno, Jiro; and Gondo, Hisashi, 4,576,639, Cl. 75-123.00E.

Goodman, Douglas S., to International Business Machines Corporation. Apparatus for proximity detection of an opaque pattern on a translucent substrate. 4,577,099, Cl. 250-216.000.

Gordon, Richard A. Tank cover. 4,576,115, Cl. 119-5.000.

Goto, Hiroshi: *See*—
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.

Goto, Sohei; and Okauchi, Ken, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,576,909, Cl. 430-546.000.

Goto, Yasuyuki: *See*—
Sugimori, Shigeru; Isoyama, Toyoshiro; and Goto, Yasuyuki, 4,576,733, Cl. 252-299.670.

Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See*—
Hegemann, Karl-Rudolf; Weissert, Helmut; and Laimkuhler, Jurgen, 4,576,803, Cl. 423-242.000.

Gould, Deryk S. M.; and Wright, Michael T., to Northern Engineering Industries, plc. Induction motors. 4,577,128, Cl. 310-87.000.

Graf, Erhard, to Alno-Mobelwerke GmbH & Co. KG. Suspension hardware for suspended cabinets. 4,576,355, Cl. 248-544.000.

Granata, Samuel J., Jr.; and Rylatt, John A., to Westinghouse Electric Corp. Fluid distributor for heat exchanger inlet nozzle. 4,576,222, Cl. 165-76.000.

Grannen, Walter A., III, to E-W Mold & Tool Company, Inc. Injection mold with thin wall hole forming means. 4,576,568, Cl. 425-577.000.

Green, David T.; and McGarry, Richard A., to United States Surgical Corporation. Surgical ligation and cutting device with safety means. 4,576,165, Cl. 128-305.000.

Greenland, John S., to Warner-Lambert Company. Vented drip chamber for use with a syringe. 4,576,594, Cl. 604-251.000.

Greenlee, William J.; and Patchett, Arthur A., to Merck & Co., Inc. 3-Hydroxy-3-aminoethyl β-lactams. 4,576,748, Cl. 260-239.00A.

Greenwood, Arthur R., to UOP Inc. Maintaining gas flow during transfer of solids in hydrocarbon conversion and gas-solid contacting processes. 4,576,712, Cl. 208-138.000.

Gregory, John R.: *See*—
Dawson, Chris R.; Dondero, John; and Parks, Gerald R., 4,575,875, Cl. 2-422.000.

Gregory, Joseph A.: *See*—
Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.

Greiner, Ulrich: *See*—
Kail, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.

Gress, Josef: *See*—
Morgan, Annis R., Jr.; Mehlan, Bernd; Gress, Josef; and Williford, Hugh S., 4,576,272, Cl. 194-215.000.

GRETAG Aktiengesellschaft: *See*—
Mueller, Kurt H., 4,577,059, Cl. 178-22.170.

Gretag San Marco S.p.A.: *See*—
Marson, Roberto, 4,576,321, Cl. 226-173.000.

Grib, Boris F., to Philamon Incorporated. Drive regulator utilizing variable pulse width signal. 4,577,164, Cl. 331-109.000.

GridComm Inc.: *See*—
Lewis, Kenneth A.; and Alpern, Alan N., 4,577,333, Cl. 375-45.000.

Griesinger, Rolf; and Fetzer, Gerhard, to Stahlecker, Hans; and Stahlecker, Fritz. Spinning rotor for an open-end spinning device and process of making same. 4,576,000, Cl. 57-416.000.

Griffin, Donnie R., to PKG Trading Company, Inc. Gun rest. 4,575,964, Cl. 42-94.000.

Griffin, Michael D.; and Waydelis, Ronald A., to General Motors Corporation. Throttle return spring assembly. 4,576,762, Cl. 261-65.000.

Grilli, Walter: *See*—
Armida, Gennaro; Sacco, Decio; and Grilli, Walter, 4,575,914, Cl. 29-434.000.

Grimmett, Earl S.: *See*—
Rasmussen, George P.; and Grimmett, Earl S., 4,576,102, Cl. 110-346.000.

Gringer, Donald. Blade retaining tool head. 4,575,936, Cl. 30-169.000.

Grip, Carl E.; Hagstad, Bertil J.; and Andersson, Bjorn H., to SSAB Svenskt Stal AB. Spring steel. 4,575,912, Cl. 29-173.000.

Gristina, Nicholas. Balances running on gears for a motor vehicle engine. 4,576,060, Cl. 74-573.00R.

Grochowski, Horst: *See*—
Koch, Manfred; Muhlhaus, Ludwig; Lambach, Rolf; and Grochowski, Horst, 4,576,924, Cl. 502-56.00C.

Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Stabilized solutions of hydroxylamine or its salts. 4,576,804, Cl. 423-265.000.

Grossman, M. Gary, to GEE Associates. Coffee maker adapted for use in a microwave oven. 4,577,080, Cl. 219-10.55E.

Grossmeyer, Mark C. Memory enhancing apparatus. 4,576,484, Cl. 368-245.000.

Gruber, Heinz: *See*—
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.

Gruenwald, David J., to Brunswick Corporation. Fuel flow deflector for use in a carburetor. 4,576,761, Cl. 261-23.00A.

Gruppo Lepetit, S.p.A.: *See*—
Favara, Duccio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,576,746, Cl. 260-239.00A.

GTE Lenkurt Incorporated: *See*—
Huft, John M.; and Kiko, Frederick J., 4,577,064, Cl. 179-16.00F.

Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N. Process for maturing strong beverages. 4,576,824, Cl. 426-241.000.

Guggenheim, S. Frederic, to United States of America, Energy. Multiport valve assembly. 4,576,201, Cl. 137-624.180.

Guidoux, Loic B. Y.: *See*—
Barazeche, Bahman; Alexis, Roger P. J.; and Guidoux, Loic B. Y., 4,577,309, Cl. 370-32.000.
Brie, Richard; and Guidoux, Loic B. Y., 4,577,329, Cl. 375-14.000.

Guittard, George V.; Deters, Joseph C.; Theeuwes, Felix; and Cortese, Richard, to ALZA Corporation. Osmotic system with instant drug availability. 4,576,604, Cl. 604-890.000.

Gulko, Arnold G. Pedal powered watercraft. 4,576,580, Cl. 440-21.000.

Gunther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, to Eastman Kodak Company. Photographically useful chalcogenazoles, chalcogenazolines, and chalcogenazolinium and chalcogenazolium salts. 4,576,905, Cl. 430-401.000.

Gurumurthy, Kadagattor V., to RCA Corporation. Teletext framing code detector. 4,577,227, Cl. 358-147.000.

Guth, Jacob J.; Lukenbach, Elvin R.; and Tenore, Richard R., to Johnson & Johnson Baby Products Company. Process for the preparation of monoacyl polyalkylene polyamines. 4,576,757, Cl. 260-404.500.

Haas, Gene F.; and Zierhut, Kurt P. Indexing device. 4,576,530, Cl. 409-223.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Walter, Lothar; Haas, Roland; and Dobhan, Herbert, 4,576,268, Cl. 192-98.000.

Haenen, Henricus W. G.; and van Leeuwen, Antonie, to U.S. Philips Corporation. Encoding circuit for a SECAM color television transmission. 4,577,217, Cl. 358-14.000.

Hafele, Walter; and Knorreck, Peter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,576,130, Cl. 123-372.000.

Hageman, Jacques; Plumet, Lucien; and Robberechts, Marcel, to INTEROX (Societe Anonyme). Process for the treatment of cellulosic materials with oxidizing agents and microwaves. 4,576,609, Cl. 8-103.000.

Hagen, Franz S.: *See*—
Mertin, Theodor; and Hagen, Franz S., 4,577,325, Cl. 373-101.000.

Hagenbach, Germain: *See*—
Demangeon, Francis; Hagenbach, Germain; and Maldonado, Paul, 4,576,648, Cl. 106-269.000.

Hagenmuller, Paul: *See*—
Colmet, Robert; Naslain, Roger; Hagenmuller, Paul; and Lamico, Pierre, 4,576,836, Cl. 427-255.000.

Hagiwara, Kenzo: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.

Hagiwara, Yoshimune: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.

Hagstad, Bertil J.: *See*—
Grip, Carl E.; Hagstad, Bertil J.; and Andersson, Bjorn H., 4,575,912, Cl. 29-173.000.

Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J, to Penlon Limited. Gas mixing and flow smoothing apparatus. 4,576,159, Cl. 128-203.140.

Hain, Paul O., to Champion International Corporation. Apparatus for forming a paperboard receptacle. 4,576,566, Cl. 425-400.000.

Haine, Walter A.: *See*—
Dyck, Manfred F.; and Haine, Walter A., 4,576,156, Cl. 128-132.00R.
Hakko Seiki Kabushiki Kaisha: *See*—
Tominaga, Katsuya, 4,576,451, Cl. 350-566.000.
Hakusan Seisakusho Co., Ltd.: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.
Hall, Charles P., to Monterey Manufacturing Co. Waterbed mattress with free floating baffle. 4,575,885, Cl. 5-450.000.
Hall, Henry B.; Hewes, Peter B.; Moore, Benjamin N.; and Sanzaro, Rosario, to Safeway Products, Inc. Contact lens disinfecting unit. 4,576,798, Cl. 422-105.000.
Hall, John B.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Use of pentamethylindanol derivatives in augmenting or enhancing the aroma or taste of smoking tobacco compositions or smoking tobacco articles. 4,576,186, Cl. 131-276.000.
Hall, John B.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Tertiary pentamethylindanol derivatives and organoleptic uses thereof. 4,576,740, Cl. 252-522.00R.
Halliburton Company: *See*—
Freeman, Tommie A., 4,576,522, Cl. 405-225.000.
Hamane, Masumi; and Hanawa, Kaoru, to Honda Giken Kogyo K.K. Automatic multispeed transmission for vehicles with manual means for prohibition of engagement of a centrifugal clutch. 4,576,269, Cl. 192-103.00A.
Hamel, Jerome T.; and Huff, Bernard G., to Hantover, Inc. Pneumatic stunner. 4,575,900, Cl. 17-1.00B.
Hamon, Burrell N.: *See*—
Arkles, Barry C.; and Hamon, Burrell N., 4,577,039, Cl. 556-409.000.
Hamprecht, Gerhard: *See*—
Parg, Adolf; Hamprecht, Gerhard; Sauter, Hubert; and Wuerzer, Bruno, 4,576,630, Cl. 71-92.000.
Hanaki, Akira: *See*—
Takeda, Nobuhiro; Hattori, Masaichi; and Hanaki, Akira, 4,577,117, Cl. 307-10.00R.
Hanawa, Kaoru: *See*—
Hamane, Masumi; and Hanawa, Kaoru, 4,576,269, Cl. 192-103.00A.
Hanlock, Inc.: *See*—
Hanson, Michael R.; and Bryant, Frank C., 4,576,532, Cl. 411-352.000.
Hanna, Marie R.: *See*—
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,576,742, Cl. 252-522.00R.
Hannani, Hamid. Device for correcting audio record's groove eccentricity. 4,577,304, Cl. 369-56.000.
Hannen, Rainer W., to MSK-Verpackungs-Systeme GmbH. Method and device for packaging palletized stacks of goods. 4,575,989, Cl. 53-434.000.
Hanota Holdings S.A.: *See*—
Van de Caveye, Yves; and Schaefle , Henri, 4,576,561, Cl. 425-104.000.
Hanscom, Bradford E.; and Mock, Gerald L., to T.A.D. Avanti, Inc. Ring delay override for telephone answering system. 4,577,063, Cl. 179-6.160.
Hansen, Per K., to Position Orientation Systems, Ltd. Passive optical position measurement system. 4,576,481, Cl. 356-375.000.
Hanson, Michael R.; and Bryant, Frank C., to Hanlock, Inc. Insulation stud. 4,576,532, Cl. 411-352.000.
Hantover, Inc.: *See*—
Hamel, Jerome T.; and Huff, Bernard G., 4,575,900, Cl. 17-1.00B.
Hara, Hideo: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.
Hara, Toshitami, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,577,202, Cl. 346-140.00R.
Harada, Jumei; Yamamoto, Keiji; and Yokoi, Takashi, to Bridgestone Corporation. Rotary roll-type rubber extruder. 4,576,563, Cl. 425-194.000.
Harada, Shinichi: *See*—
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.
Harada, Tokuya; Higashiura, Tadashi; and Okubo, Misae, to Daikin Kogyo Co., Ltd. Strains of *Rhizobium phaseoli* and preparation of cyclic (1→2)-β-D-glucan. 4,576,915, Cl. 435-101.000.
Hardman, Paul D.: *See*—
Edwards, Robert J.; and Hardman, Paul D., 4,576,744, Cl. 252-554.000.
Hardouin, Pierre; Lameyre, Felix; and Paris, Claude, to La Telemecanique Electrique. Connection device for electric conductor. 4,576,429, Cl. 339-95.00D.
Hardy, Thomas R.: *See*—
Laiewski, Stanislaus; Hessen, Thomas A.; Hardy, Thomas R.; and Gilvin, Allie F., 4,576,278, Cl. 206-204.000.
Hargett, Wyatt P., Jr., to Celanese Corporation. Process for extruding and sizing foamed thermoplastic cigarette filter rods. 4,576,769, Cl. 264-51.000.
Harlan, Wayne E., to RCA Corporation. Driver amplifier for an image display device. 4,577,234, Cl. 358-243.000.
Harmon, Don B.: *See*—
Allred, Von D.; and Harmon, Don B., 4,576,400, Cl. 285-5.000.
Harmon, John L.: *See*—
Eddens, Fletcher C.; White, David W.; and Harmon, John L., 4,576,654, Cl. 148-11.50F.
Harms, Wolfgang: *See*—
Jager, Horst; Harms, Wolfgang; and Herd, Karl J., 4,577,015, Cl. 544-76.000.
Harmuth, Ann P., to International Business Machines Corporation. Method of predicting and controlling the viscosity of conductive pastes. 4,576,736, Cl. 252-512.000.
Harris Graphics Corporation: *See*—
Jackson, Dale H., 4,576,370, Cl. 270-54.000.
Harris, Ivor R.: *See*—
Wootton, Malcolm J.; and Harris, Ivor R., 4,576,640, Cl. 75-123.00E.
Harris, Richard J.; Pithouse, Kenneth B.; and Van Dijck, Frans S. J., to Raychem Limited. Heat-recoverable article. 4,576,666, Cl. 156-85.000.
Harrison Equipment Co., Inc.: *See*—
McMinn, Robert R., 4,575,926, Cl. 29-598.000.
Harrison, George W., to Team, Inc. Leak repair clamp. 4,576,401, Cl. 285-15.000.
Harrison, Ray E.: *See*—
Murray, Charles R.; and Harrison, Ray E., 4,576,844, Cl. 428-35.000.
Hart, Ronald E.: *See*—
Carlson, Frederick D.; and Hart, Ronald E., 4,575,898, Cl. 16-274.000.
Harte, J. Richard. Instructional and testing apparatus with switch closure at two different depths. 4,576,579, Cl. 434-334.000.
Hartman, Robert A., to Standard Oil Company, The. Bypass diode assembly for photovoltaic modules. 4,577,051, Cl. 136-244.000.
Hartman, Thomas A. Elastically conformable tapered pin-key. 4,576,504, Cl. 403-318.000.
Hartmann, Clinton S., to R. F. Monolithics, Inc. Notch filter. 4,577,168, Cl. 333-170.000.
Hartmann, Werner: *See*—
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.
Lauer, Reinhard; and Hartmann, Werner, 4,576,047, Cl. 73-597.000.
Hartsing, Tyler F.; Sauers, Marvin E.; and Robeson, Lloyd M., to Union Carbide Corporation. Cookware formed from a laminate. 4,576,842, Cl. 428-35.000.
Haruta, Toshio: *See*—
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,576,716, Cl. 210-496.000.
Harvey Hubbell Incorporated: *See*—
Wuertz, Emil S., 4,577,055, Cl. 174-48.000.
Harwell, Betty L. Booster fan and air deflector for floor vents. 4,576,331, Cl. 236-49.000.
Hasegawa, Yuuji: *See*—
Fushida, Akira; Hasegawa, Yuuji; and Matsui, Toshikazu, 4,576,465, Cl. 355-3.0DD.
Hasenauer, Dieter; and Hug, Kuno, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,576,881, Cl. 429-104.000.
Hashiguchi, Toshihiko, to Olympus Optical Co., Ltd. Hard endoscope with improved light dispersion. 4,576,147, Cl. 128-6.000.
Hashimoto, Masashi: *See*—
Kamiya, Takashi; Hashimoto, Masashi; and Nakaguti, Osamu, 4,576,753, Cl. 260-239.00A.
Hashimoto, Noriyoshi: *See*—
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, 4,577,141, Cl. 318-590.000.
Hashimoto, Osamu: *See*—
Satoh, Susumu; Hashimoto, Osamu; and Irie, Toshio, 4,576,657, Cl. 148-12.00C.
Hashimoto, Tsuguo: *See*—
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.
Hashizume, Aiichiro: *See*—
Jidai, Eiki; and Hashizume, Aiichiro, 4,576,694, Cl. 204-181.100.
Hass, Robert H.; and Ward, John W., to Union Oil Company of California. Catalyst and process for oxidizing hydrogen sulfide. 4,576,814, Cl. 423-573.00G.
Hastings, Donald R.; and Sharpless, John, to Nordson Corporation. Electrostatic spray coating system. 4,576,827, Cl. 427-27.000.
Hataishi, Osamu: *See*—
Kanbara, Kazuhiro; and Hataishi, Osamu, 4,575,925, Cl. 29-576.00W.
Hatamura, Yotaro. Load detector. 4,576,053, Cl. 73-862.660.
Hatch, Marcus R.: *See*—
Abel, Irving R.; and Hatch, Marcus R., 4,576,452, Cl. 350-620.000.
Hatsuno, Susumu: *See*—
Wagatsuma, Mitsuyoshi; Hatsuno, Susumu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,576,938, Cl. 514-206.000.
Hatta, Susumu, to Tachikawa Spring Co. Ltd. Head-rest including a device to permit pivotal adjustment thereof relative to a vehicle seat. 4,576,413, Cl. 297-408.000.
Hattori, Masaichi: *See*—
Takeda, Nobuhiro; Hattori, Masaichi; and Hanaki, Akira, 4,577,117, Cl. 307-10.00R.
Hattori, Shintaroo: *See*—
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.

Hattori, Takemi, to Aisen Seiki Kabushika Kaisha. Lumbar support for a backrest. 4,576,410, Cl. 297-284.000.

Haug, Edward W., to Barber-Colman Company. Shaper cutter. 4,576,527, Cl. 407-28.000.

Hausselt, Jurgen: *See—*
Rothaut, Josef; Hausselt, Jurgen; Steinke, Rudi; and Klaus, Angela, 4,576,790, Cl. 420-464.000.

Hawk Industries, Inc.: *See—*
Rogak, Michael; Golan, Leonard W.; Witbeck, Charles; and Golan, Stephen L., 4,575,962, Cl. 42-1.00Q.

Hawrylo, Frank Z., to RCA Corporation. Method of bonding semiconductor devices to heatsinks. 4,576,326, Cl. 228-171.000.

Hayakawa, Kiyoharu: *See—*
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, 4,576,705, Cl. 204-406.000.

Hayashi, Isao, to Kyocera Corporation. Variable tuning filter in high frequency circuit. 4,577,170, Cl. 333-205.000.

Hayashi, Shin'ichi: *See—*
Yoshida, Akiyoshi; Kametaka, Shigeru; and Hayashi, Shin'ichi, 4,576,914, Cl. 435-42.000.

Hayashi, Tsuneo: *See—*
Tani, Nobutaka; and Hayashi, Tsuneo, 4,576,928, Cl. 502-404.000.

Hayden, Arthur H.: *See—*
Chambers, Worthy L.; Jones, William H.; and Hayden, Arthur H., 4,577,179, Cl. 340-309.150.

Hayden, Earl E.: *See—*
Chatterjee, Ananda M.; and Hayden, Earl E., 4,576,983, Cl. 524-101.000.

Haydt, Mette, legal representative: *See—*
Coakley, James L.; and Haydt, Richard J., deceased, 4,576,198, Cl. 137-596.000.

Haydt, Richard J., deceased: *See—*
Coakley, James L.; and Haydt, Richard J., deceased, 4,576,198, Cl. 137-596.000.

Haynie, Henry C., Sr.: *See—*
Slaughter, William B.; and Haynie, Henry C., Sr., 4,576,235, Cl. 166-374.000.

Hazard, Gary M.; Hillman, Arthur E.; Montierth, Max R.; and Nieber, Albert R., to Corning Glass Works. Flexible mask and means for applying to honeycomb structures. 4,576,774, Cl. 264-267.000.

Heaven, Malcolm D.: *See—*
Tamplin, Paul; and Heaven, Malcolm D., 4,576,993, Cl. 525-240.000.

Hecht, Michael D.: *See—*
Ferree, Herbert E.; Wagner, Thomas R.; Hecht, Michael D.; and Donnelly, Thomas J., 4,577,127, Cl. 310-83.000.

Hecken, Gerhard: *See—*
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Hecken, Gerhard, 4,576,524, Cl. 405-260.000.

Heckler & Koxh GmbH: *See—*
Brandl, Rudolf; and Danner, Helmut, 4,576,084, Cl. 89-14.400.

Hedberg, David J.; Denta, Edward P., Jr.; and Jo Chiong, Victor E., to Digital Engineering, Ltd. Multiple zone multiple disk video recording system. 4,577,240, Cl. 360-22.000.

Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,576,996, Cl. 525-439.000.

Heerlein, Manfred: *See—*
Bentele, Benedikt; and Heerlein, Manfred, 4,576,489, Cl. 384-469.000.

Hefner, Robert E., Jr.: *See—*
Ellerbe, Gilbert B., III; and Hefner, Robert E., Jr., 4,576,998, Cl. 525-455.000.

Hegemann, Karl-Rudolf; Weissert, Helmut; and Laimkuhler, Jurgen, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Method of producing calcium sulfate dihydrate in connection with the desulfurization of flue gases. 4,576,803, Cl. 423-242.000.

Heigl, Franz; and Rehm, Josef, to Telefunken electronic GmbH. Input circuit comprising at least two input paths. 4,577,171, Cl. 334-1.000.

Heikkila, Pertti: *See—*
Issakainen, Onni; and Heikkila, Pertti, 4,576,525, Cl. 405-269.000.

Heimbuerger, Wolfgang: *See—*
Gardenier, Karl-Josef; and Heimbuerger, Wolfgang, 4,576,835, Cl. 427-222.000.

Heinrich Baumgarten KG Eisen- und Blechwarenfabrik: *See—*
Fischbach, Wolfgang, 4,575,897, Cl. 16-110.00A.

Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Hecken, Gerhard, to Bochumer Eisenhuette Heintzmann GmbH & Co. KG. Rock anchor arrangement. 4,576,524, Cl. 405-260.000.

Helmut Lingemann GmbH & Co.: *See—*
Lingemann, Horst, 4,576,841, Cl. 428-34.000.

Hemmeter, George T.: *See—*
Stevens, Joy; and Hemmeter, George T., 4,575,894, Cl. 15-172.000.

Hempelmann, Heinrich J., to NI Industries, Inc. Wheel trim retention system. 4,576,415, Cl. 301-37.00S.

Hendriks, John G. Cabinet drawers security locking device. 4,576,423, Cl. 312-216.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Gardenier, Karl-Josef; and Heimbuerger, Wolfgang, 4,576,835, Cl. 427-222.000.

Henning, John C., to Product Investment Incorporated. Easy-open closure. 4,576,304, Cl. 220-269.000.

Henschel, Claude: *See—*
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,576,873, Cl. 428-606.000.

Her Majesty the Queen in Right of the Province of Alberta as represented by the Minister of Energy and Natural Resources: *See—*
Kentfield, John A. C., 4,576,064, Cl. 74-833.000.

Herbst, Manfred O.: *See—*
Snider, Alan D.; Soporowski, Andrzej L.; and Herbst, Manfred O., 4,576,328, Cl. 229-1.50R.

Hercules Incorporated: *See—*
Gardiner, Richard J., 4,576,849, Cl. 428-119.000.

Herd, Karl J.: *See—*
Jager, Horst; Harms, Wolfgang; and Herd, Karl J., 4,577,015, Cl. 544-76.000.

Herman, Edmund A., to General Motors Corporation. SMC Loader for compression molding press. 4,576,560, Cl. 425-103.000.

Hermann Heye: *See—*
Seidel, Hans-Georg, 4,576,624, Cl. 65-300.000.

Herriau, Jean P.: *See—*
Huignard, Jean P.; Rajbenbach, Henri; Loiseaux, Brigitte; and Herriau, Jean P., 4,576,434, Cl. 350-3.640.

Herrick, Robert S. Intraocular lens having loops defining a posterior capsule barrier. 4,575,877, Cl. 623-6.000.

Herrmann, Alan J., to General Motors Corporation. Flexible printed circuit connector and contact eyelet therefor. 4,576,426, Cl. 339-17.00F.

Hertl, William; and Weetall, Howard H., to Corning Glass Works. Hydrogen peroxide production using a non-aqueous system. 4,576,687, Cl. 204-157.500.

Herve, Jean-Luc A., to Compagnie Francaise des Petroles. Device for working on a submerged valve. 4,576,193, Cl. 137-15.000.

Hess, Gerhard: *See—*
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.

Hessen, Thomas A.: *See—*
Laiewski, Stanislaus; Hessen, Thomas A.; Hardy, Thomas R.; and Gilvin, Allie F., 4,576,278, Cl. 206-204.000.

Hetzel, Gerhard. Safety shoe with toe protecting cap. 4,575,953, Cl. 36-77.00R.

Hewes, Peter B.: *See—*
Hall, Henry B.; Hewes, Peter B.; Moore, Benjamin N.; and Sanzaro, Rosario, 4,576,798, Cl. 422-105.000.

Hewlett-Packard Company: *See—*
Pace, Noel M., 4,577,159, Cl. 330-9.000.

Hibino, Ikuo; and Miyajima, Mikio, to Alps Electric Company, Ltd. Thermal transfer printer. 4,577,198, Cl. 346-76.0PH.

Hibino, Masaaki, to Brother Industries, Ltd. Pen recording apparatus. 4,577,206, Cl. 346-139.00R.

Hidle, Jerry, to Panhandle Industries, Inc. Lint removal device. 4,575,890, Cl. 15-104.00A.

Hieber, Udo: *See—*
Erhardt, Werner; and Hieber, Udo, 4,577,257, Cl. 361-272.000.

Higaki, Hiromichi: *See—*
Miyazaki, Nobuyuki; Takayanagi, Takashi; and Higaki, Hiromichi, 4,576,977, Cl. 523-137.000.

Higashiguchi, Teruaki: *See—*
Miyakawa, Nobuhiro; Maekawa, Kouji; Higashiguchi, Teruaki; and Nakatani, Kaname, 4,576,888, Cl. 430-106.000.

Higashihata, Yoshihide: *See—*
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.

Higashitani, Yoshitaka: *See—*
Kozai, Shinji; Shiiba, Suenobu; and Higashitani, Yoshitaka, 4,575,970, Cl. 51-165.920.

Higashiura, Tadashi: *See—*
Harada, Tokuya; Higashiura, Tadashi; and Okubo, Misae, 4,576,915, Cl. 435-101.000.

High, Paul G.: *See—*
Kuchyt, James R.; and High, Paul G., 4,576,543, Cl. 414-722.000.

Hikami, Masahiro: *See—*
Yoshimura, Yutaka; and Hikami, Masahiro, 4,577,286, Cl. 364-708.000.

Hilger, Manfred; Hultzsch, Gunter; and Keiper, Roman, to Hoechst Aktiengesellschaft. Adhesive composition. 4,576,981, Cl. 524-40.000.

Hill, T. Don, to Ferguson Manufacturing, Inc. Wild turkey call. 4,576,584, Cl. 446-193.000.

Hille, Hans-Dieter: *See—*
Poth, Ulrich; and Hille, Hans-Dieter, 4,576,868, Cl. 428-423.100.

Hilleary, Thomas N.; and Fulton, Robert D., to Butler National Corporation. Method for dispensing information. 4,577,062, Cl. 179-2.00A.

Hillman, Arthur E.: *See—*
Hazard, Gary M.; Hillman, Arthur E.; Montierth, Max R.; and Nieber, Albert R., 4,576,774, Cl. 264-267.000.

Hinch, Mark G.: *See—*
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., 4,577,314, Cl. 370-94.000.

Hinkley, David, to Mobil Oil Corporation. Method for correcting surface consistent statics in seismic traces. 4,577,298, Cl. 367-50.000.

Hinton, Michael. Produce support tray assemblage. 4,576,293, Cl. 211-127.000.

Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, to Hoechst Aktiengesellschaft. Pharmaceutical compositions. 4,576,947, Cl. 514-263.000.

Hiramatsu, Ryo: *See—*
Sano, Yoshiaki; Omura, Isamu; and Hiramatsu, Ryo, 4,577,121, Cl. 307-355.000.

Hirano, Hiroyuki: *See*—
Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,576,265, Cl. 192-0.055.
Hirano, Tsumoru; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color light-sensitive material containing magenta color image-forming polymer or copolymer coupler latex. 4,576,910, Cl. 430-548.000.
Hiraoka, Hiroshi: *See*—
Sakata, Hiromi; Kozuka, Nobuhiko; and Hiraoka, Hiroshi, 4,576,464, Cl. 355-3.00R.
Hirohashi, Kazutoshi; Ishigaki, Yukinobu; and Namiki, Yasuomi, to Victor Company of Japan, Ltd. Noise reduction by linear interpolation using a dual function amplifier circuit. 4,577,161, Cl. 330-149.000.
Hirokazu, Sakaki; and Takizawa, Kazushige, to Fuji Photo Film Co., Ltd. Process for producing aluminum support for lithographic printing plates. 4,576,686, Cl. 204-33.000.
Hirose, Iwao: *See*—
Yamasaki, Masahiro; Hirose, Iwao; Fukushima, Masao; and Yoshida, Ichiro, 4,576,467, Cl. 355-10.000.
Hirose, Naohiro; Sasaki, Osamu; and Takizawa, Yoshio, to Konishiroku Photo Industry Co., Ltd. Azo photoreceptor. 4,576,886, Cl. 430-59.000.
Hirschfeld, Tomas B., to University of California, Regents of the. Remote multi-position information gathering system and method. 4,577,109, Cl. 250-461.100.
Hitachi Chemical Company, Ltd.: *See*—
Kuwajima, Hideji; and Watanabe, Takeyoshi, 4,576,856, Cl. 428-241.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.
Hitachi Engineering Co., Ltd.: *See*—
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.
Sugano, Akira; Muramatsu, Masaru; Yamanobe, Sachio; and Sato, Yoshio, 4,577,270, Cl. 364-151.000.
Hitachi, Ltd.: *See*—
Akita, Kenji; Sakaguchi, Minoru; and Suzuyama, Hiroshi, 4,577,075, Cl. 200-148.00R.
Arai, Ikuya; Murata, Toshinori; and Kazumi, Masafumi, 4,577,228, Cl. 358-167.000.
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, 4,576,735, Cl. 252-512.000.
Maeda, Kenji, 4,576,545, Cl. 414-735.000.
Moriyama, Shigeo, 4,575,942, Cl. 33-1.00M.
Oguino, Masanori, 4,576,442, Cl. 350-418.000.
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; and Takemoto, Iwao, 4,577,230, Cl. 358-212.000.
Saiki, Eisaku; Kawamura, Satoshi; and Kawauchi, Masataka, 4,577,199, Cl. 346-76.0PH.
Saitou, Norio; Ozasa, Susumu; and Matsuzaka, Takashi, 4,577,111, Cl. 250-492.200.
Sugano, Akira; Muramatsu, Masaru; Yamanobe, Sachio; and Sato, Yoshio, 4,577,270, Cl. 364-151.000.
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.
Takata, Yoshinori; and Taki, Mamoru, 4,576,706, Cl. 204-409.000.
Takeuchi, Takashi; Nishimura, Keizo; Kobayashi, Masaharu; and Oiso, Kazumasa, 4,577,319, Cl. 371-38.000.
Tanisaka, Satoshi; and Michiguchi, Yoshihiro, 4,577,151, Cl. 324-158.0MG.
Yamauchi, Teruo; Nogi, Toshiharu; and Oyama, Yoshishige, 4,576,136, Cl. 123-590.000.
Hitachi, Ltd: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, 4,576,876, Cl. 428-679.000.
Hitachi Maxell, Ltd.: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, 4,576,876, Cl. 428-679.000.
Hitachi Micro Computer Engineering Ltd.: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.
Hitora, Shozo, to Sasaki Electric Manufacturing Co., Ltd. Reflection type flow-flashing light. 4,577,178, Cl. 340-81.00R.
Hlaban, James J., to Kimberly-Clark Corporation. Sanitary napkin set. 4,576,597, Cl. 604-390.000.
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, to American Cyanamid Company. 2,3-Diamino-substituted-4(3H)-pyrimidinones and platinum chelates. 4,577,018, Cl. 544-225.000.
Ho, Gary S.; and Peterson, Ralph W., to AT&T Bell Laboratories. Demand paging scheme for a multi-ATB shared memory processing system. 4,577,274, Cl. 364-200.000.
Hodara, Henri; and Wells, Willard H., to Tetra-Tech, Inc. Security system with randomly modulated probe signal. 4,577,184, Cl. 340-566.000.
Hodge, James D., to General Electric Company. Zircon-cordierite composite ceramic. 4,576,919, Cl. 501-9.000.
Hodgman, John S.; and Mullersman, Ferdinand H., to General Electric Company. Battery charging system including means for distinguishing between rechargeable and non-rechargeable batteries. 4,577,144, Cl. 320-2.000.
Hoechst AG: *See*—
Ross, Barry C.; and Johnson, Graham, 4,576,939, Cl. 514-210.000.
Hoechst Aktiengesellschaft: *See*—
Dorrer, Bernhard; and Strametz, Helmut, 4,576,994, Cl. 525-247.000.
Hilger, Manfred; Hultzsch, Gunter; and Keiper, Roman, 4,576,981, Cl. 524-40.000.
Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, 4,576,947, Cl. 514-263.000.
Mischke, Peter; and Fuchs, Hermann, 4,576,755, Cl. 260-245.780.
Stahlhofen, Paul; and Mack, Gerhard, 4,576,901, Cl. 430-325.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,577,026, Cl. 546-216.000.
Martin, Lawrence L.; and Setescak, Linda L., 4,576,960, Cl. 514-450.000.
Hoesch Aktiengesellschaft: *See*—
Bechem, Werner; Peters, Hubertus; Solms, Jurgen; and Wolfhard, Dietrich, 4,576,684, Cl. 204-28.000.
Hoet, Roland: *See*—
Park, David B.; Snyder, James R.; McDonald, Gerard J.; and Hoet, Roland, 4,576,277, Cl. 198-803.010.
Hoffman-La Roche Inc.: *See*—
Hubschwerlen, Christian N.; and Schmid, Gerard, 4,576,751, Cl. 260-245.400.
Hoffmann, Gerhard; Kleuser, Dieter; and Lenz, Werner, to BASF Aktiengesellschaft. Process of making photopolymer relief plates using an adhesive layer. 4,576,898, Cl. 430-306.000.
Hoffmann-La Roche Inc.: *See*—
Machin, Peter J., 4,577,030, Cl. 548-255.000.
Hofman, Johannes H. A.: *See*—
Corvers, Antonius; and Hofman, Johannes H. A., 4,577,023, Cl. 546-122.000.
Hohner, Terrance D.: *See*—
Charney, Gregory S.; Hohner, Terrance D.; and Salibello, Cosmo, 4,576,454, Cl. 351-243.000.
Hokuetsu Industries Co., Ltd.: *See*—
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,576,558, Cl. 418-150.000.
Holden, Kenneth M., to 501 W B Lock Company. Trailer lock. 4,576,021, Cl. 70-34.000.
Holder, Kurt, to Chr. Eisele Maschinenfabrik GmbH & Co. KG. Circular saw machine. 4,576,075, Cl. 83-464.000.
Hollenstein, Helmut: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,576,506, Cl. 403-407.100.
Holliger, Christoph: *See*—
Corbet, Aaron B.; Holliger, Christoph; and Strul, Bruno, 4,576,477, Cl. 356-39.000.
Hollingsworth, Alexander, to Nordson Corporation. Skin packaging machine with vacuum frame. 4,575,991, Cl. 53-509.000.
Hollis, Samuel D., to Union Camp Corporation. Dicyclopentadiene resins. 4,577,006, Cl. 526-283.000.
Holmes, Russell C.: *See*—
Lane, E. James; Holmes, Russell C.; and Markyvech, Ronald K., 4,576,263, Cl. 192-0.044.
Holtz, Frederick C., Jr., to Crucible Materials Corporation. Alloy composition and process. 4,576,642, Cl. 75-239.000.
Holzer, Walter: *See*—
Faul, Wolfgang; Furst, Leander; Holzer, Walter; and Kastening, Bertel, 4,576,677, Cl. 156-642.000.
Holzinger, Charles E.; and Fee, David M., to Caterpillar Tractor Co. Brake release mechanism for vehicle towing. 4,576,418, Cl. 303-71.000.
Homsy, Charles A. Porous body-implantable polytetrafluoroethylene. 4,576,608, Cl. 623-11.000.
Honda Giken Kogyo K.K.: *See*—
Hamane, Masumi; and Hanawa, Kaoru, 4,576,269, Cl. 192-103.00A.
Yamato, Akihiro; and Otobe, Yutaka, 4,576,134, Cl. 123-480.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kenichi, Nagahiro, 4,576,128, Cl. 123-198.00F.
Nakazawa, Masao; Yashima, Michio; and Takahashi, Shuuji, 4,576,879, Cl. 429-86.000.
Honeywell Inc.: *See*—
Abel, Irving R.; and Hatch, Marcus R., 4,576,452, Cl. 350-620.000.
Bauhahn, Paul E., 4,577,213, Cl. 357-69.000.
Carney, James K.; and Kolbas, Robert M., 4,577,321, Cl. 372-50.000.
Culp, Norman L., 4,577,163, Cl. 331-1.00A.
Fitch, Robert C.; and Narendra, Pat M., 4,577,223, Cl. 358-113.000.
White, William J., 4,576,679, Cl. 156-644.000.
Honjo, Kazuhiko: *See*—
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, 4,576,700, Cl. 204-192.00M.
Hooghordel, Rijk; and van Jole, Franciscus P., to U.S. Philips Corporation. Cathode-ray tube having a gettering device and gettering device suitable for said tube. 4,577,136, Cl. 313-481.000.
Hoogovens Groep B.V.: *See*—
Felthuis, Jacob; and Tournier, Joseph H., 4,576,081, Cl. 87-6.000.
Hooven, Michael D.; and Saulson, Stanley H., to Cordis Corporation. Self-calibrating differential condition sensor. 4,576,035, Cl. 73-4.00R.

Hope, Henry F.; and Hope, Stephen F. Cathode composition and method for solid state lithium battery. 4,576,883, Cl. 429-192.000.
Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,576,883, Cl. 429-192.000.
Hopper, Ian: *See*—
McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.
Hopper, Michael G.; and Prival, Harri G., to Sperry Corporation. Multiple microcomputer system for digital computers. 4,577,273, Cl. 364-200.000.
Hori, Fumihisa: *See*—
Sugawara, Fukuo; Iwane, Yasuhiko; Hori, Fumihisa; and Onozato, Takashi, 4,576,492, Cl. 400-146.000.
Horiuchi, Ichiro: *See*—
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.
Horn, Dieter: *See*—
Eisenlauer, Josef; Horn, Dieter; and Neuwirth, Manfred, 4,576,723, Cl. 210-709.000.
Horn, Edward R.; and Kot, Norbert J., II, to Aladdin Engineering & Mfg. Co. Pneumatic mechanical clamp including locking means. 4,576,367, Cl. 269-32.000.
Horton Manufacturing Co., Inc.: *See*—
Schilling, Hugh K.; Dayen, Leonid; and Raines, Charles D., 4,576,266, Cl. 192-70.120.
Horton, Stuart L.; and Kann, Frederick P. Tab dispenser with odor applicator. 4,576,311, Cl. 221-73.000.
Hoshino, Shuji: *See*—
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.
Hosoi, Noriyuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Process for producing heat-sensitive recording paper. 4,576,831, Cl. 427-40.000.
Hosoi, Noriyuki, to Fuji Photo Film Co., Ltd. Preparation of encapsulated electrostatographic toner material. 4,576,890, Cl. 430-137.000.
Hoster, Thomas: *See*—
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.
Hovel, Harold J.; and Kuech, Thomas F., to International Business Machines Corporation. Incoherent light annealing of gallium arsenide substrate. 4,576,652, Cl. 148-1.500.
Howe, Dennis G.; and Wrobel, Joseph J., to Eastman Kodak Company. Method for optically writing and/or reading information on optical recording elements. 4,577,306, Cl. 369-109.000.
Howering, Robert, to Eaton Corporation. Nonresiliently deformable fastener. 4,576,535, Cl. 411-503.000.
HR Textron Inc.: *See*—
Boyer, Kent R.; and Cobb, Clyde E., 4,576,203, Cl. 137-625.630.
Coakley, James L.; and Haydt, Richard J., deceased, 4,576,198, Cl. 137-596.000.
HRI, Inc.: *See*—
Nongbri, Govanon; and Chervenak, Michael C., 4,576,710, Cl. 208-58.000.
Huang, Wann-Sheng; Mims, Donald S.; and Allen, Richard S., to Texaco Inc. Method and apparatus for determining quality and mass flow rate of flowing steam. 4,576,036, Cl. 73-29.000.
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Hughes Aircraft Company: *See*—
Yu, I-Ping, 4,577,196, Cl. 343-705.000.
Hughes, William B. Method of providing fertilizer from brines. 4,576,627, Cl. 71-41.000.
Huhn, John H.; and Spector, George. Pole shell building. 4,575,978, Cl. 52-234.000.
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Huignard, Jean P.; Rajbenbach, Henri; Loiseaux, Brigitte; and Herriau, Jean P., to Thomson-CSF. Device for recording a coherent image in a multimode optical cavity. 4,576,434, Cl. 350-3.640.
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Norden, Jurgen; Aigner, Heinrich; Schindler, Fritz; and Samblebe, Reinhard, 4,576,625, Cl. 71-3.000.
Hultgren, Kent G.: *See*—
Smed, Jan P.; Seitzer, Kenneth E.; and Hultgren, Kent G., 4,576,548, Cl. 415-137.000.
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Hilger, Manfred; Hultzsch, Gunter; and Keiper, Roman, 4,576,981, Cl. 524-40.000.
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Hurley, Brian J. E.; and Rachwal, Anthony J., to Thames Water Authority. Process for thickening digested sludge. 4,576,719, Cl. 210-620.000.
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Hydril Company: *See*—
Mott, James D.; and Wolff, Danny K., 4,576,358, Cl. 251-14.000.
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Wagenseil, Ludwig; and Lotter, Manfred, 4,576,554, Cl. 417-270.000.
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Ichikawa, Hiromichi: *See*—
Suganuma, Nobuo; Anzai, Masafumi; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,576,816, Cl. 424-50.000.
ICS Electronics Corporation: *See*—
Chu, Paul C.; and Mercola, Gerald K., 4,577,317, Cl. 370-110.100.
Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, to Unitika, Ltd. Method of producing water treatment medium and medium produced thereby. 4,576,716, Cl. 210-496.000.
Iida, Shinzo: *See*—
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.
Iizumi, Toyoko: *See*—
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yashio; and Iizumi, Toyoko, 4,577,025, Cl. 546-198.000.
Ikari, Kazuo, to Olympus Optical Co., Ltd. Photographic lens system for compact cameras. 4,576,448, Cl. 350-465.000.
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Tahara, Tetsuya; Ikebe, Tsuguo; Terasawa, Michio; and Imayoshi, Tomonori, 4,576,940, Cl. 514-212.000.
Ikeda, Kensuke: *See*—
Hosoi, Noriyuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,576,831, Cl. 427-40.000.
Ikeda, Masato: *See*—
Miyazaki, Hiroshi; and Ikeda, Masato, 4,576,174, Cl. 128-639.000.
Illinois Tool Works Inc.: *See*—
Barth, Gerald D.; and Wagner, David P., 4,576,534, Cl. 411-412.000.
Saari, Oliver, 4,576,057, Cl. 74-424.80C.
Imada, Isuke, to Takeda Chemical Industries, Ltd. Hydroquinone sulfate derivatives and production thereof. 4,576,760, Cl. 558-37.000.
Imaide, Takuya: *See*—
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
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Tabuchi, Makoto; and Imanishi, Kiyoshi, 4,575,995, Cl. 53-591.000.
Imayoshi, Tomonori: *See*—
Tahara, Tetsuya; Ikebe, Tsuguo; Terasawa, Michio; and Imayoshi, Tomonori, 4,576,940, Cl. 514-212.000.
IMEX AG: *See*—
Versteeg, Gijsbert, 4,575,984, Cl. 52-589.000.
Imi-Tech Corporation: *See*—
Lee, Raymond; and Ferro, Gregory A., 4,576,862, Cl. 428-317.700.
Imperial Chemical Industries Limited: *See*—
Robinson, Frank, 4,576,815, Cl. 423-658.500.
Imperial Chemical Industries, PLC: *See*—
Carroll, William G.; and Rosbotham, Ian D., 4,576,974, Cl. 521-173.000.
Le Count, David J., 4,576,953, Cl. 514-312.000.
Imperial Metal & Chemical Company: *See*—
Amariti, Luigi; and Santos, Llandro C., 4,576,899, Cl. 430-309.000.
Inaba, Hajimu; and Torii, Nobutoshi, to Fanuc Ltd. Robot system. 4,576,537, Cl. 414-222.000.
Inaba, Masahito: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse, Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, 4,576,470, Cl. 355-38.000.

Inadome, Kiyotaka, to Nippon Kogaku K. K. Zoom lens. 4,576,445, Cl. 350-427.000.
Inai, Yuichi: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, to Victor Company of Japan, Ltd. Level display device for audio signal. 4,577,188, Cl. 340-721.000.
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Conover, Gilbert, Jr.; and Richard, Gary R., 4,576,487, Cl. 374-183.000.
Inject Star Pokelmaschinen GmbH: *See*—
Prosenbauer, Otto, 4,575,899, Cl. 17-1.00G.
Inline Plastics Corporation: *See*—
Schepp, Frank, 4,576,330, Cl. 229-44.00R.
Inokuti, Yukio; Kobayashi, Yasuhiro; and Ito, Yo. Method for manufacturing grain-oriented silicon steel sheet. 4,576,658, Cl. 148-111.000.
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Inoue, Kiyoshi, 4,577,082, Cl. 219-69.00D.
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Inoue MTP Co., Ltd.: *See*—
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.
Inoue, Takeo: *See*—
Arai, Masatoshi; Futatsumori, Koji; Inoue, Takeo; and Sato, Shinichi, 4,577,041, Cl. 556-446.000.
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Mailfert, Alain-Jacques, 4,577,126, Cl. 310-52.000.
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Yoda, Yasutada; Sueyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, 4,576,559, Cl. 425-28.00R.
Intel Corporation: *See*—
Eitan, Boaz; Kolodny, Avi; Amrany, Daniel; and McCreary, James, 4,577,295, Cl. 365-218.000.
Intermetrics, Inc.: *See*—
Ragsdale, William A., 4,577,194, Cl. 343-401.000.
International Biotechnologies, Inc.: *See*—
Kreisher, John H.; and Nalbantian, Charles A., 4,576,693, Cl. 204-180.100.
Peck, Lawrence J.; and Kreisher, John H., 4,576,702, Cl. 204-299.00R.
Peck, Lawrence J.; Kreisher, John H.; and Walker, Alan L., 4,576,703, Cl. 204-299.00R.
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Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.
Barton, Roger W.; Coufal, Hans J.; Jipson, Victor B.; and Lee, Wen Y., 4,576,895, Cl. 430-270.000.
Bernstein, Kerry, 4,577,292, Cl. 365-189.000.
Busch, Dennis G., 4,577,288, Cl. 364-900.000.
Christy, Arthur E.; and Gill, Elmer J., 4,577,284, Cl. 364-513.000.
Comerford, Liam D.; and White, Steve R., 4,577,289, Cl. 364-900.000.
Gallagher, James P.; and Schmidt, Howard W., Jr., 4,576,698, Cl. 204-192.00E.
Goodman, Douglas S., 4,577,099, Cl. 250-216.000.
Harmuth, Ann P., 4,576,736, Cl. 252-512.000.
Hovel, Harold J.; and Kuech, Thomas F., 4,576,652, Cl. 148-1.500.
Hueckel, Gary R.; and Prokop, George S., 4,577,212, Cl. 357-68.000.
Lewis, Robert K.; and Ray, Sudipta K., 4,576,659, Cl. 148-127.000.
Matick, Richard E.; and Ling, Daniel T., 4,577,293, Cl. 365-189.000.
Walker, George A., 4,576,832, Cl. 427-43.100.
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Thorogood, Robert M., 4,576,121, Cl. 122-7.00R.
International Cybernetics Corporation: *See*—
Jones, Donald H.; and Allen, Spencer W., 4,577,271, Cl. 364-174.000.
International Flavors & Fragrances Inc.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,576,739, Cl. 252-522.00R.
Hall, John B.; and Yoshida, Takao, 4,576,186, Cl. 131-276.000.
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Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,576,741, Cl. 252-522.00R.
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,576,742, Cl. 252-522.00R.
International Rectifier Corporation: *See*—
Gault, John M., 4,577,210, Cl. 357-38.000.
International Standard Electric Corporation: *See*—
Schwanitz, Manfred; Gaertner, Dietrich; Dressler, Wolfgang; and Schenk, Joerg, 4,577,195, Cl. 343-702.000.
International Telephone and Telegraph Corporation: *See*—
Reed, Joseph, 4,577,157, Cl. 329-50.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Johnson, Richard S., 4,576,737, Cl. 252-522.00A.
INTEROX (Societe Anonyme): *See*—
Hageman, Jacques; Plumet, Lucien; and Robberechts, Marcel, 4,576,609, Cl. 8-103.000.
Inukai, Takashi: *See*—
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
Iofis, Naum A.: *See*—
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., 4,576,605, Cl. 623-2.000.
Iovine, Carmine P.; Palmer, Joseph G.; and Walker, James L., to National Starch and Chemical Corporation. Polymerizable imidazolidinones. 4,577,031, Cl. 548-319.000.
Iphas Pharma-Verpackung: *See*—
Mommer, Heinrich, 4,576,593, Cl. 604-250.000.
Ipri, Alfred C.: *See*—
Stewart, Roger G.; and Ipri, Alfred C., 4,577,215, Cl. 357-23.500.
Irie, Toshio: *See*—
Satoh, Susumu; Hashimoto, Osamu; and Irie, Toshio, 4,576,657, Cl. 148-12.00C.
Isaksson, Rolf H. V.: *See*—
Flensburg, Carl G. A.; and Isaksson, Rolf H. V., 4,576,369, Cl. 270-54.000.
Isgar, Charles B.; and Isgar, Shirley K. Container for use with plastic bags. 4,576,310, Cl. 220-404.000.
Isgar, Shirley K.: *See*—
Isgar, Charles B.; and Isgar, Shirley K., 4,576,310, Cl. 220-404.000.
Ishida, Toshiyuki: *See*—
Uehara, Akira; Uehara, Takashi; Saito, Miyuki; and Ishida, Toshiyuki, 4,577,165, Cl. 331-109.000.
Ishigaki, Yukinobu: *See*—
Hirohashi, Kazutoshi; Ishigaki, Yukinobu; and Namiki, Yasuomi, 4,577,161, Cl. 330-149.000.
Ishihara, Shousaku: *See*—
Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, 4,576,735, Cl. 252-512.000.
Ishii, Fumiaki, to Olympus Optical Co., Ltd. Endoscope connecting device. 4,576,144, Cl. 128-4.000.
Ishii, Fumiaki: *See*—
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,576,650, Cl. 134-22.120.
Ishii, Jun: *See*—
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Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, to Sumitomo Chemical Company, Limited. Stabilizer for synthetic resins. 4,576,734, Cl. 252-404.000.
Ishikawa, Aiichi: *See*—
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, 4,577,141, Cl. 318-590.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.
Ishikura, Tadashi: *See*—
Echigo, Yoshiaki; Suematsu, Yoshiyuki; and Ishikura, Tadashi, 4,576,969, Cl. 521-28.000.
Isobe, Minoru, to Oki Electric Industry Co., Ltd. Multihead serial printer. 4,576,490, Cl. 400-82.000.
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, to Hitachi, Ltd. Ferroelectric liquid crystal compounds and liquid crystal compositions. 4,576,732, Cl. 252-299.650.
Isomura, Hiroyasu: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,576,588, Cl. 493-475.000.
Isoyama, Toyoshiro: *See*—
Sugimori, Shigeru; Isoyama, Toyoshiro; and Goto, Yasuyuki, 4,576,733, Cl. 252-299.670.
Issakainen, Onni; and Heikkila, Pertti, to Oy Tampella AB. Method and equipment for performing rock bolting. 4,576,525, Cl. 405-269.000.
Italtractor I.T.M. S.p.A.: *See*—
Armida, Gennaro; Sacco, Decio; and Grilli, Walter, 4,575,914, Cl. 29-434.000.
Ito, Hiroshi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,576,063, Cl. 74-745.000.
Ito, Kunio: *See*—
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.
Ito, Masazumi; and Murata, Tomoji, to Minolta Camera Kabushiki Kaisha. Control apparatus for copying machine. 4,576,472, Cl. 355-50.000.
Ito, Yo: *See*—
Inokuti, Yukio; Kobayashi, Yasuhiro; and Ito, Yo, 4,576,658, Cl. 148-111.000.
Itoh, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens with high variable power ratio including wide-angle capability. 4,576,443, Cl. 350-427.000.
ITT Corporation: *See*—
Martin, Philip T., 4,577,255, Cl. 361-119.000.
Merrill, Dana A., 4,577,331, Cl. 375-17.000.

Ivanov, Vladimir V.: *See—*
Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N., 4,576,824, Cl. 426-241.000.

Iversen, Elmer A. Security grille apparatus for doors and windows. 4,575,965, Cl. 49-50.000.

Ivy-Gene Co., Inc.: *See—*
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,576,591, Cl. 604-62.000.

Iwai, Yoshiyuki: *See—*
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.

Iwamatsu, Seiichi, to Kabushiki Kaisha Suwa Seikosha. Semiconductor substrate. 4,576,851, Cl. 428-156.000.

Iwane, Yasuhiko: *See—*
Sugawara, Fukuo; Iwane, Yasuhiko; Hori, Fumihisa; and Onozato, Takashi, 4,576,492, Cl. 400-146.000.

Iwasaki, Kishiroo: *See—*
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.

Izumisawa, Nobuyuki. Grinding machine. 4,575,973, Cl. 51-170.0TL.

J. Eberspacher: *See—*
Worner, Siegfried; Ottle, Walter; and Klein, Herbert, 4,576,799, Cl. 422-176.000.

J. I. Case Company: *See—*
Carlson, Frederick D.; and Hart, Ronald E., 4,575,898, Cl. 16-274.000.

J. M. Huber Corporation: *See—*
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J. M. Voith GmbH: *See—*
Scheuter, Siegbert; and Kuhn, Friedrich, 4,576,343, Cl. 242-66.000.
Schiel, Christian, 4,576,681, Cl. 162-301.000.

Jackson, Dale H., to Harris Graphics Corporation. Method and apparatus for tipping closely incidental mail to magazines or the like. 4,576,370, Cl. 270-54.000.

Jackson, David M.; Matthews, Billie J.; and Bornslaeger, S. Richard, to Kimberly-Clark Corporation. Resilient shape-retaining sanitary napkin. 4,576,596, Cl. 604-370.000.

Jager, Horst; Harms, Wolfgang; and Herd, Karl J., to Bayer Aktiengesellschaft. Triphendioxazine vinyl sulphone dyestuffs. 4,577,015, Cl. 544-76.000.

Jahn-Held, Wilhelm: *See—*
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,576,513, Cl. 405-128.000.

Jakubowski, William J.: *See—*
Ungchusri, Tep; and Jakubowski, William J., 4,576,385, Cl. 277-124.000.

Jalowayski, Alfredo A. Nasal dilator. 4,576,168, Cl. 128-342.000.

Jamerson, Robert L.: *See—*
Dillon, Larry W.; Jamerson, Robert L.; and Padgett, Thomas M., 4,576,848, Cl. 428-89.000.

Jamerson, Willis B.; and Spector, George. Sleeping bag sheet insert. 4,575,884, Cl. 5-420.000.

Janecke, James P.; and Patel, Kishor J., to Applied Power Inc. Hydraulic pressure reducing control valve. 4,576,200, Cl. 137-624.130.

Janssen, Wilhelm: *See—*
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.

Japan Spectroscopic Co., Ltd.: *See—*
Fukasawa, Yoshiro; Fukazawa, Tomoyuki; and Kawamura, Michihiro, 4,577,106, Cl. 250-347.000.

Japanese National Railways: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.

Jarrett, Steve A.; and Krzyston, John F., to Reynolds Metals Company. Method and apparatus for recycling cans. 4,576,289, Cl. 209-631.000.

Jarrow Products, Inc.: *See—*
Gerritsen, John T., 4,575,966, Cl. 49-209.000.

Jeffries, Derek K.; and McMillan, Duncan J., to United Kingdom Atomic Energy Authority. Liquid metal ion sources. 4,577,135, Cl. 313-362.100.

Jeneric Industries, Inc.: *See—*
Prasad, Arun, 4,576,789, Cl. 420-464.000.

Jensen, Paul L.: *See—*
Mueller, Edward E.; and Jensen, Paul L., 4,576,572, Cl. 432-13.000.

Jeppesen, Borge: *See—*
Aas, Flemming; and Jeppesen, Borge, 4,576,595, Cl. 604-256.000.

Jidai, Eiki; and Hashizume, Aiichiro, to Mitsubishi Denki Kabushiki Kaisha. Method for producing electrically insulated conductor. 4,576,694, Cl. 204-181.100.

Jipson, Victor B.: *See—*
Barton, Roger W.; Coufal, Hans J.; Jipson, Victor B.; and Lee, Wen Y., 4,576,895, Cl. 430-270.000.

Jo Chiong, Victor E.: *See—*
Hedberg, David J.; Denta, Edward P., Jr.; and Jo Chiong, Victor E., 4,577,240, Cl. 360-22.000.

Joa, Curt G., to Curt G. Joa, Inc. Fasteners for diapers. 4,576,600, Cl. 604-390.000.

Jodoin, Raymond C., to Rogers Corporation. Decoupled integrated circuit package. 4,577,258, Cl. 361-321.000.

Johansson, Lennart: *See—*
Ljungkvist, Stig-ake; and Johansson, Lennart, 4,576,510, Cl. 404-49.000.

John Brown Automation Limited: *See—*
Dixon, Derek; and Richardson, Barry A., 4,576,038, Cl. 73-40.700.

John Wyeth & Brother, Ltd.: *See—*
Crossley, Roger; and Dickinson, Kay H., 4,576,955, Cl. 514-335.000.
Crossley, Roger; and Shepherd, Robin G., 4,577,022, Cl. 546-14.000.

Johns Hopkins University, The: *See—*
Parker, John G.; and Stanbro, William D., 4,576,173, Cl. 128-633.000.

Johnson, David. Audio signal generator. 4,576,178, Cl. 128-670.000.

Johnson, Dwight E.: *See—*
Porter, William F.; Porter, Michael J.; and Johnson, Dwight E., 4,576,620, Cl. 65-9.000.

Johnson, Graham: *See—*
Ross, Barry C.; and Johnson, Graham, 4,576,939, Cl. 514-210.000.

Johnson, Irvin D., to Marathon Oil Company. Flow basket. 4,576,042, Cl. 73-155.000.

Johnson, James M., Jr.: *See—*
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., 4,577,314, Cl. 370-94.000.

Johnson & Johnson Baby Products Company: *See—*
Guth, Jacob J.; Lukenbach, Elvin R.; and Tenore, Richard R., 4,576,757, Cl. 260-404.500.

Johnson, Michael R.: *See—*
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,576,964, Cl. 514-546.000.

Johnson, Richard S., to Internationale Octrooi Maatschappij "Octropa" B.V. Encapsulation of volatile liquids. 4,576,737, Cl. 252-522.00A.

Johnson, Ronald M., to TRW Inc. Fuel injection apparatus employing electric power converter. 4,576,135, Cl. 123-490.000.

Johnson, Thomas E.; and Spencer, Terrance D., to Timberjack Inc. Rotational grapple. 4,576,406, Cl. 294-86.410.

Johnson, William M. Pad for a shoulder strap. 4,575,874, Cl. 2-268.000.

Johnston, Robert D.; and Forse, Nicholas J. A., to British Telecommunications. Echo canceller with adaptive residual center clipper controlled by echo estimate. 4,577,071, Cl. 179-170.200.

Jonca, Henri V. J., to Societe Nationale Industrielle Aerospatialle. Device for automatically connecting electric conductors on a regrouping member. 4,575,931, Cl. 29-747.000.

Jones, Donald H.; and Allen, Spencer W., to International Cybernetics Corporation. Sampled data servo control system. 4,577,271, Cl. 364-174.000.

Jones, Everett E., to Boeing Company, The. Slip joint tooling fixture for airframe structure and the like. 4,576,575, Cl. 432-253.000.

Jones, Franklin B.: *See—*
Milberger, Walter E.; and Jones, Franklin B., 4,577,166, Cl. 332-9.00T.

Jones, Howard: *See—*
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,576,941, Cl. 514-222.000.

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Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward E., 4,577,283, Cl. 364-464.000.

Jones, William H.: *See—*
Chambers, Worthy L.; Jones, William H.; and Hayden, Arthur H., 4,577,179, Cl. 340-309.150.

Joos, Manfred; and Maack, Werner, to AMP Incorporated. Hand tool for terminating wires in a connector. 4,575,932, Cl. 29-751.000.

Josefsson, Erik A. A., to SSAB Svenskt Stal AB. Method for producing high strength steel with good ductility. 4,576,655, Cl. 148-12.00F.

Juhasz, Istvan. Soccer practice apparatus. 4,576,379, Cl. 273-411.000.

Juhasz, Josef: *See—*
Eschrich, Gerhard; Juhasz, Josef; and Schwab, Manfred, 4,577,143, Cl. 318-701.000.

Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,576,506, Cl. 403-407.100.

Juneau, Matthew K., to Ethyl Corporation. Removal of salt from polyphosphazene. 4,576,806, Cl. 423-300.000.

Jung, Lothar. Manufacture of preforms for energy transmitting fibers. 4,576,622, Cl. 65-13.000.

Junkosha Co. Ltd.: *See—*
Kato, Hiroshi, 4,576,861, Cl. 428-316.600.

Jurdi, Wissam J.: *See—*
Shibata, Tomoo; and Jurdi, Wissam J., 4,577,204, Cl. 346-200.000.
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Juty, Andrzej J. J.: *See—*
Kelsey, Stephen F.; and Juty, Andrzej J. J., 4,576,306, Cl. 220-271.000.

Juutilainen, Timo, to Delcon Oy. Adapter for field signals of computers, mic:oprocessor systems or the like digital electronic circuits. 4,577,267, Cl. 363-19.000.

K-Jack Engineering Company, Inc.: *See—*
Chalabian, Jack S., 4,576,271, Cl. 194-233.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Koshimo, Masahiko, 4,576,260, Cl. 192-3.310.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Matsumoto, Minoru, 4,576,240, Cl. 173-105.000.

Kabushiki Kaisha Nikken Kousakusho: *See*—
Matumoto, Masakazu, 4,576,058, Cl. 74-425.000.
Kabushiki Kaisha Nipponcoinco: *See*—
Kobayashi, Osamu; Tanaka, Masanori; and Ishii, Jun, 4,576,275, Cl. 194-203.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Iwamatsu, Seiichi, 4,576,851, Cl. 428-156.000.
Kawamura, Yoshikazu, 4,577,203, Cl. 346-140.00R.
Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Takeda, Nobuhiro; Hattori, Masaichi; and Hanaki, Akira, 4,577,117, Cl. 307-10.00R.
Kabushiki Kaisha Toshiba: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,576,692, Cl. 204-165.000.
Koike, Hideharu, 4,577,124, Cl. 307-451.000.
Nambu, Shigeo, 4,577,327, Cl. 375-4.000.
Nishida, Naoto; Takahashi, Tadashi; and Kakizaki, Katsuyuki, 4,577,324, Cl. 372-95.000.
Noda, Yasumasa; and Suzuki, Yoichi, 4,577,078, Cl. 219-10.55A.
Sujaku, Takamichi, 4,577,079, Cl. 219-10.55D.
Tsunashima, Yoshitaka, 4,575,920, Cl. 29-571.000.
Yamaura, Mitsuru, 4,577,254, Cl. 361-80.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Anahara, Meiji; and Omori, Hiroshi, 4,575,999, Cl. 57-333.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, 4,576,705, Cl. 204-406.000.
Sugiyama, Susumu, 4,576,052, Cl. 73-862.630.
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, to Teijin Limited. Perpendicular magnetic recording medium method for producing the same, and sputtering device. 4,576,700, Cl. 204-192.00M.
Kaeding, Warren W.; and Lee, Carol S., to Mobil Oil Corporation. ZSM-5/ZSM-12 Catalyst mixture for cracking alkylbenzenes. 4,577,050, Cl. 585-486.000.
Kaeufer, Helmut; and Burr, August, to Deutsche Solvay Werke GmbH. Process for the preparation of injection molded-stretch formed thermoplastic resin articles. 4,576,775, Cl. 264-323.000.
Kafka, Henry J.: *See*—
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., 4,577,314, Cl. 370-94.000.
Kaganowicz, Grzegorz; Robinson, John W.; and Thomas, John H., III, to RCA Corporation. Low temperature growth of silicon dioxide on silicon. 4,576,829, Cl. 427-39.000.
Kahilathi, Matti; Ventola, Keijo; Virtanen, Matti; and Huhta, Pentti, to Kone Oy. Procedure for affixing bearing hoops on outer surface of large diameter drum. 4,576,327, Cl. 228-212.000.
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., to Nauchno-Issledovatelsky Institut Khirurgii Imeni A.V. Vishnevskogo. Cardiac valve prosthesis. 4,576,605, Cl. 623-2.000.
Kaiser, Donald B., to RCA Corporation. Electrode structure for an electron multiplier cage assembly. 4,577,137, Cl. 313-533.000.
Kakizaki, Katsuyuki: *See*—
Nishida, Naoto; Takahashi, Tadashi; and Kakizaki, Katsuyuki, 4,577,324, Cl. 372-95.000.
Kakonyi, Gyula: *See*—
Kassza, Tibor; Kakonyi, Gyula; and Molnar, Gabor, 4,576,025, Cl. 70-276.000.
Kalama Chemical, Inc.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,577,027, Cl. 546-345.000.
Kalbfell, Heinz; Lieder, Bernhard; and Mercamp, Herbert, to Ruhrchemie Aktiengesellschaft. Process for the preparation of aldehydes. 4,577,043, Cl. 568-454.000.
Kalkomey, Cynthia T.; Mason, Thomas J.; and Pann, Keh, to Mobil Oil Corporation. Method for enhancing recorded marine seismic reflection signals having undulating water bottom distortions. 4,577,297, Cl. 367-24.000.
Kamata, Shigeru, to Canon Kabushiki Kaisha. Zoom lens mounting. 4,576,446, Cl. 350-429.000.
Kambara, Goro; and Fujii, Makoto, to Sony Corporation. Apparatus for coating viscous material on a seal edge surface of a cathode ray tube. 4,576,113, Cl. 118-697.000.
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, to Kabushiki Kaisha Kobe Seiko Sho. Method and apparatus of continuous casting by the use of mold oscillating system. 4,577,277, Cl. 364-472.000.
Kametaka, Shigeru: *See*—
Yoshida, Akiyoshi; Kametaka, Shigeru; and Hayashi, Shin'ichi, 4,576,914, Cl. 435-42.000.
Kamiya, Takashi; Hashimoto, Masashi; and Nakaguti, Osamu, to Fujisawa Pharmaceutical Co., Ltd. Azetidinone compounds and processes for preparation thereof. 4,576,753, Cl. 260-239.00A.
Kampfer, Helmut; Langen, Hans; and Ranz, Erwin, to Agfa Gevaert Aktiengesellschaft. Color-photographic recording material. 4,576,907, Cl. 430-507.000.
Kampfmann, Georg: *See*—
Maack, Werner; Kampfmann, Georg; and Foerster, Peter, 4,576,032, Cl. 72-431.000.
Kana, Kenneth W.; Kana, Willie H.; and Seidel, Francis L., to Fluorocarbon/Sepco. Method and apparatus for assembling spiral wound gasket rings into gauge rings. 4,575,917, Cl. 29-520.000.
Kana, Willie H.: *See*—
Kana, Kenneth W.; Kana, Willie H.; and Seidel, Francis L., 4,575,917, Cl. 29-520.000.
Kanai, Junichi: *See*—
Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, 4,576,558, Cl. 418-150.000.
Kanbara, Kazuhiro; and Hataishi, Osamu, to Fujitsu Limited. Method for fabricating a SOI type semiconductor device. 4,575,925, Cl. 29-576.00W.
Kanda, Yoichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kanda, Yoichi; Satake, Keigo; Shinkawa, Hiroyasu; and Yamazaki, Shiro, 4,577,029, Cl. 548-162.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Murata, Shouichi; Makiyama, Muneto; Omoto, Takahiro; and Yasumoto, Taizo, 4,576,840, Cl. 428-16.000.
Tani, Nobutaka; and Hayashi, Tsuneo, 4,576,928, Cl. 502-404.000.
Kaneko, Takaoki: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,576,692, Cl. 204-165.000.
Kang, En T.: *See*—
Ehrlich, Paul; Anderson, Wayne A.; Kang, En T.; and Bhatt, Ansuya P., 4,576,887, Cl. 430-71.000.
Kann, Frederick P.: *See*—
Horton, Stuart L.; and Kann, Frederick P., 4,576,311, Cl. 221-73.000.
Kannapell, Henry N.; and Nietfeld, Paul G., to Mead Corporation, The. Text/continuous tone image decision processor. 4,577,235, Cl. 358-280.000.
KAO Corporation: *See*—
Urata, Koichi; Takaishi, Naotake; and Suzuki, Yuji, 4,576,967, Cl. 514-772.000.
Kaplan, Alan; and Amato, James, to Emkay Manufacturing Co. Crystal plating slug apparatus. 4,576,114, Cl. 118-720.000.
Kapralis, Imants P. Reinforced lightweight plastic packages. 4,576,282, Cl. 206-524.000.
Kapur, Jagdish C.; and Fasel, Herman P., to Gist-Brocades N.V. Preparation of 6,6-dibromo-penicillanic acid-1,1-dioxide. 4,576,754, Cl. 260-245.20R.
Kartavenko, Alex: *See*—
Donato, Anthony C.; and Kartavenko, Alex, 4,577,266, Cl. 362-296.000.
Kashio, Shigetra: *See*—
Fujikawa, Junichi; Togashi, Osamu; and Kashio, Shigetra, 4,576,897, Cl. 430-273.000.
Kasper, James D.: *See*—
Proud, Todd A.; Lin, Tom F.; Mitchell, Wayne J.; and Kasper, James D., 4,576,185, Cl. 128-760.000.
Kassza, Tibor; Kakonyi, Gyula; and Molnar, Gabor, to ELZETT Muvek. Magnetic lock insert for lock mechanisms. 4,576,025, Cl. 70-276.000.
Kastening, Bertel: *See*—
Faul, Wolfgang; Furst, Leander; Holzer, Walter; and Kastening, Bertel, 4,576,677, Cl. 156-642.000.
Katagiri, Hidenori: *See*—
Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, 4,576,725, Cl. 252-62.510.
Katagiri, Katsumasa: *See*—
Sugiyama, Tohru; Suzuki, Yasuo; Katagiri, Katsumasa; and Furutani, Satoshi, 4,576,930, Cl. 514-23.000.
Katayama, Yasuyuki: *See*—
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.
Kato, Hiroshi, to Junkosha Co. Ltd. Material for gaseous diffusion electrode. 4,576,861, Cl. 428-316.600.
Kato, Toshikazu: *See*—
Emura, Noriaki; Ariyoshi, Takashi; and Kato, Toshikazu, 4,577,004, Cl. 526-204.000.
Kato, Yasuyuki: *See*—
Tatsukami, Yoshiharu; Kato, Yasuyuki; and Wake, Shigeo, 4,576,438, Cl. 350-96.340.
Katoh, Yoshinori: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Katsuyama, Akira; and Kimura, Shuichi, to Sony Corporation. Disc players for reproducing an information signal from a rotating disc. 4,577,300, Cl. 369-43.000.
Katzeff, Kurt; and Petre, Tommy. Arrangement for a pay telephone payment system utilizing a payment card within the telecommunication system. 4,577,061, Cl. 179-2.0AM.
Kaufmann, Rudolf; Braunsperger, Karl; Wegehaupt, Karl-Heinrich; and von Au, Gunter, to Wacker-Chemie GmbH. Method for preparing diorganopolysiloxanes containing fluoroalkyl groups. 4,577,040, Cl. 556-462.000.
Kauserud, Hakon, to Dansk Industri Syndikat A/S. Method for the production of frozen mould bodies and apparatus for use in the carrying out of the method. 4,576,215, Cl. 164-15.000.
Kavehrad, Mohsen, to AT&T Bell Laboratories. Cross-polarization interference cancellation arrangement for digital radio channels. 4,577,330, Cl. 375-15.000.
Kawagoe, Nobukazu: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse, Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, 4,576,470, Cl. 355-38.000.

Kawai, Kozo: *See*—
Otuka, Shinpei; Kawai, Kozo; and Kusunoki, Toshio, 4,576,149, Cl. 128-33.000.
Kawaken Fine Chemicals Co., Ltd.: *See*—
Matsushita, Noritaka, 4,576,647, Cl. 106-193.00R.
Kawamata, Toshio, to Fuji Photo Film Co., Ltd. Surface smoothing method for disk-like recording medium. 4,577,077, Cl. 219-10.430.
Kawamura, Atsushi, to Ricoh Company, Ltd. Macro-focus zoom lens. 4,576,444, Cl. 350-428.000.
Kawamura, Michihiro: *See*—
Fukasawa, Yoshiro; Fukazawa, Tomoyuki; and Kawamura, Michihiro, 4,577,106, Cl. 250-347.000.
Kawamura, Satoshi: *See*—
Saiki, Eisaku; Kawamura, Satoshi; and Kawauchi, Masataka, 4,577,199, Cl. 346-76.0PH.
Kawamura, Yoshikazu, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet recording apparatus. 4,577,203, Cl. 346-140.00R.
Kawasaki Seitetsu Kabushiki Kaisha: *See*—
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.
Kawasaki Steel Corporation: *See*—
Kozai, Shinji; Shiiba, Suenobu; and Higashitani, Yoshitaka, 4,575,970, Cl. 51-165.920.
Miyake, Hidenori; Fujiwara, Shunji; Nakazato, Yoshio; Yanagishima, Fumiya; and Teshiba, Toko, 4,576,029, Cl. 72-205.000.
Satoh, Susumu; Obara, Takashi; and Nishida, Minoru, 4,576,656, Cl. 148-12.00C.
Satoh, Susumu; Hashimoto, Osamu; and Irie, Toshio, 4,576,657, Cl. 148-12.00C.
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, to Nippon Petrochemicals Co., Ltd.; and Arakawa Kagaku Kogyo Kabushiki Kaisha. Method of sizing paper. 4,576,680, Cl. 162-158.000.
Kawauchi, Masataka: *See*—
Saiki, Eisaku; Kawamura, Satoshi; and Kawauchi, Masataka, 4,577,199, Cl. 346-76.0PH.
Kawazoe, Chisato; Yoshida, Kenichi; and Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Fiberscope. 4,576,146, Cl. 128-6.000.
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., to Ivy-Gene Co., Inc. Medicament implant applicator. 4,576,591, Cl. 604-62.000.
Kazumi, Masafumi: *See*—
Arai, Ikuya; Murata, Toshinori; and Kazumi, Masafumi, 4,577,228, Cl. 358-167.000.
Kearney & Trecker Corporation: *See*—
Mattson, Clyde E., 4,575,918, Cl. 29-568.000.
Kedzior, Edward S., to Allegheny Ludlum Steel Corporation. Reusable shipping container. 4,576,300, Cl. 217-13.000.
Keel, Frederick; Townsend, Keith G.; and Carter, Marshall C., to Bentley Engineering Company Limited. Circular knitting machine having improved take-down apparatus. 4,576,019, Cl. 66-147.000.
Keezer, William J., to Bose Corporation. Electroacoustical transducer. 4,577,069, Cl. 179-119.00R.
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, to Cassella Aktiengesellschaft. Copolymer, process for its preparation and its use as a sorbent. 4,576,973, Cl. 521-149.000.
Keintzel, Gunter; and Westebbe, Klaus, to L. & C. Steinmuller GmbH. Water separator for drying wet vapor, with subsequent superheating of the dried vapor. 4,576,125, Cl. 122-483.000.
Keiper Dynavit GmbH & Co.: *See*—
Lautenschlager, Peter, 4,576,051, Cl. 73-862.360.
Keiper, Roman: *See*—
Hilger, Manfred; Hultzsch, Gunter; and Keiper, Roman, 4,576,981, Cl. 524-40.000.
Keledjian, Gaston: *See*—
Passemard, Jean-Robert; and Keledjian, Gaston, 4,576,544, Cl. 414-735.000.
Keller, Reinhold: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.
Kelly, Thomas J.; and Tyler, Daniel W., to AT&T Information Systems Inc. Adaptive modular telephone cradle for a communication terminal. 4,577,068, Cl. 179-100.00R.
Kelman, Charles D. Intraocular lenses. 4,576,607, Cl. 623-6.000.
Kelsey, Stephen F.; and Juty, Andrzej J. J., to Metal Box plc. Closure for a container having vent and tethered means. 4,576,306, Cl. 220-271.000.
Kempers, Eugene K., to Midwest Energy Services Company. Pump suction vacuum lift vortex control. 4,576,197, Cl. 137-565.000.
Kendall, James M., Jr.: *See*—
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,576,926, Cl. 502-339.000.
Keneson, Jerry L. Device for holding and aiding in the sharpening of welding rods. 4,575,971, Cl. 51-236.000.
Kenichi, Nagahiro, to Honda Giken Kogyo Kabushiki Kaisha. Valve operation stopping means for multi-cylinder engine. 4,576,128, Cl. 123-198.00F.
Kennedy, John T.: *See*—
Newman, Leon A.; and Kennedy, John T., 4,577,323, Cl. 372-64.000.
Kentfield, John A. C., to Her Majesty the Queen in Right of the Province of Alberta as represented by the Minister of Energy and Natural Resources. Coupling mechanism for wind turbine. 4,576,064, Cl. 74-833.000.
Keralox B.V.: *See*—
Felthuis, Jacob; and Tournier, Joseph H., 4,576,081, Cl. 87-6.000.
Kernforschungsanlage Julich GmbH: *See*—
Faul, Wolfgang; Furst, Leander; Holzer, Walter; and Kastening, Bertel, 4,576,677, Cl. 156-642.000.
Kernighan, Brian W.: *See*—
Dunlop, Alfred E.; and Kernighan, Brian W., 4,577,276, Cl. 364-491.000.
Kerr, Howard A.: *See*—
Frey, Alan E.; and Kerr, Howard A., 4,577,065, Cl. 179-18.0BC.
Kerst, Donald W., to United States of America, Energy. Push-pull betatron pair. 4,577,156, Cl. 328-237.000.
Keskkula, Henno: *See*—
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,576,721, Cl. 210-640.000.
Key, Richard. Animal immobilizing apparatus and method. 4,576,171, Cl. 128-421.000.
Keyes, Marion A., IV; Lui, Peter K.; and Malcolm, Jack W., deceased (by Malcolm, Elizabeth J., executrix), to Babcock & Wilcox Company, The. Three-mode analog controller with remote tuning. 4,577,097, Cl. 250-211.00K.
Khurtsilava, Semen G.: *See*—
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., 4,576,605, Cl. 623-2.000.
Kies, Anton M. Ground rod. 4,577,053, Cl. 174-7.000.
Kiko, Frederick J.: *See*—
Huft, John M.; and Kiko, Frederick J., 4,577,064, Cl. 179-16.00F.
Kim, Suk K.; and Viswanathan, Thayamkulangara R., to AT&T Bell Laboratories. Trimless bandgap reference voltage generator. 4,577,119, Cl. 307-297.000.
Kimata, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. Solid image-pickup device. 4,577,233, Cl. 358-213.000.
Kimberly-Clark Corporation: *See*—
Hlaban, James J., 4,576,597, Cl. 604-390.000.
Jackson, David M.; Matthews, Billie J.; and Bornslaeger, S. Richard, 4,576,596, Cl. 604-370.000.
Kimura, Shuichi: *See*—
Katsuyama, Akira; and Kimura, Shuichi, 4,577,300, Cl. 369-43.000.
Kimura, Yoshiaki: *See*—
Murakami, Kiyotaka; and Kimura, Yoshiaki, 4,577,201, Cl. 346-140.00R.
King, Larry K.: *See*—
Fields, James R.; Rogers, Elmer H., Jr; and King, Larry K., 4,576,690, Cl. 204-67.000.
King Seeley Thermos Co.: *See*—
Nelson, Kenneth L., 4,576,016, Cl. 62-320.000.
Kinne, Stanley F., to Lear Siegler, Inc. Trailer frame structure. 4,576,398, Cl. 280-789.000.
Kinoshita, Kensaku: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Kinugawa, Masumi: *See*—
Muto, Yukio; Kinugawa, Masumi; and Abe, Tomoaki, 4,576,039, Cl. 73-118.000.
Kiriake, Masaharu: *See*—
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,576,341, Cl. 242-35.50A.
Kirksey, Patricia E., to University Hospital. Disposable syringe needle separation and storage box. 4,576,281, Cl. 206-370.000.
Kiryu, Koji: *See*—
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.
Kishkovsky, Zbignev N.: *See*—
Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N., 4,576,824, Cl. 426-241.000.
Kiss, Zoltan, to Chronar Corp. Deposition of materials. 4,576,830, Cl. 427-39.000.
Kita, Nobuyuki; and Matsumoto, Hiroshi, to Fuji Photo Film Co., Ltd. Plate cleaner for lithographic printing plate. 4,576,743, Cl. 252-524.000.
Kita, Nobuyuki: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,576,893, Cl. 430-457.000.
Kita, Yuzo: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.
Kitagawa, Takahiro; and Totsuka, Masao, to Canon Kabushiki Kaisha. Contacting method and apparatus in contact copying. 4,576,475, Cl. 355-91.000.
Kitajima, Goro: *See*—
Nemoto, Shigeru; Kitajima, Goro; Saitou, Sinichi; and Osada, Hazime, 4,577,245, Cl. 360-93.000.
Kitakami, Osamu: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, 4,576,876, Cl. 428-679.000.
Kitamoto, Tatsuji: *See*—
Araki, Hiroaki; and Kitamoto, Tatsuji, 4,576,635, Cl. 75-0.5AA.
Kitamura, Kengo; and Murata, Hitoshi, to Nissan Motor Company, Limited. Method and system for automatically attaching sub-assembly to main assembly using industrial robots. 4,575,934, Cl. 29-787.000.

Kitamura, Masahiro, to Tachikawa Spring Co., Ltd. Vehicle seat. 4,576,411, Cl. 297-353.000.
Kitamura, Teruo: *See*—
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
Kitazawa, Yoshikazu: *See*—
Fujita, Takayuki; Kitazawa, Yoshikazu; Akita, Tadashi; and Tani, Isamu, 4,577,032, Cl. 548-341.000.
Kiuchi, Eiichi; Sawanaka, Hiroshi; and Tomita, Yuichi, to NEC Corporation. Coherent sidelobe canceller for radar. 4,577,193, Cl. 343-380.000.
Klaus, Angela: *See*—
Rothaut, Josef; Hausselt, Jurgen; Steinke, Rudi; and Klaus, Angela, 4,576,790, Cl. 420-464.000.
Klein, Herbert: *See*—
Worner, Siegfried; Ottle, Walter; and Klein, Herbert, 4,576,799, Cl. 422-176.000.
Kleuser, Dieter: *See*—
Hoffmann, Gerhard; Kleuser, Dieter; and Lenz, Werner, 4,576,898, Cl. 430-306.000.
Klie, Jurgen; and Nehl, Rainer, to Dr. Ing. Rudolf Hell GmbH. Method and an apparatus for copying retouch in electronic color picture reproduction. 4,577,219, Cl. 358-78.000.
Klingel, Hans; and Brekle, Erich, to Trumpf GmbH & Co. Grinding machine for punching tools. 4,575,969, Cl. 51-131.100.
Klinvex, Daniel E.: *See*—
Ferree, Herbert E.; Klinvex, Daniel E.; and Vestovich, Robert P., 4,576,034, Cl. 73-1.0DV.
Klockner-Humboldt-Deutz Aktiengeselischaft: *See*—
Wallenfang, Gerd; and Glockner, Manfred, 4,576,129, Cl. 123-357.000.
Kloeckner Ferromatik Desma GmbH: *See*—
Roseland, Hermann; and Bark, Manfred, 4,575,889, Cl. 12-15.000.
Klomp, Edward D., to General Motors Corporation. Fuel injector with hoop nozzle spray tip. 4,576,338, Cl. 239-452.000.
Kloster, Kenneth D. Tool for removing fasteners from shock absorber cylinders. 4,576,066, Cl. 81-176.300.
Klostermann, Heinrich F. Cable termination for x-ray tubes. 4,577,339, Cl. 378-121.000.
Kluna, Vlastimil: *See*—
Humpolik, Bohumil; Kluna, Vlastimil; Winterer, Wilfried; Kuchelmeister, Reinhold; and Bayer, Jurgen, 4,576,223, Cl. 165-79.000.
KMW Products Limited: *See*—
Kuchyt, James R.; and High, Paul G., 4,576,543, Cl. 414-722.000.
Knapp, Alfons, to Masco Corporation. Mixing valve. 4,576,202, Cl. 137-625.170.
Knappik, Winfried: *See*—
Blaschke, Hans P.; Knappik, Winfried; Mette, Horst; and Scholler, Peter, 4,577,299, Cl. 367-120.000.
Knight, Alan C. Claw hammer with protective cushion. 4,576,361, Cl. 254-26.00R.
Knight, Jack D.: *See*—
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,576,232, Cl. 166-274.000.
Knight, Raymond P.: *See*—
Menown, Hugh; and Knight, Raymond P., 4,577,138, Cl. 313-599.000.
Knipp, Ulrich: *See*—
Ganster, Otto; Knipp, Ulrich; and Luckas, Bruno, 4,576,970, Cl. 521-51.000.
Knop, Karl H.: *See*—
Gale, Michael T.; Knop, Karl H.; and Ebnother, Martin, 4,576,439, Cl. 350-162.230.
Knorreck, Peter: *See*—
Hafele, Walter; and Knorreck, Peter, 4,576,130, Cl. 123-372.000.
Kobayashi, Akio: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.
Kobayashi, Akira; and Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Data extracting circuit. 4,577,155, Cl. 328-164.000.
Kobayashi, Hiroyasu; Fukui, Masayuki; and Nomoto, Shosaku, to Kurashiki Boseki Kabushiki Kaisha. Apparatus for the production of reinforcing non-woven fabrics for composites. 4,576,672, Cl. 156-177.000.
Kobayashi, Kazuo: *See*—
Sakamoto, Koji; and Kobayashi, Kazuo, 4,576,463, Cl. 355-3.0DD.
Kobayashi, Masaharu: *See*—
Takeuchi, Takashi; Nishimura, Keizo; Kobayashi, Masaharu; and Oiso, Kazumasa, 4,577,319, Cl. 371-38.000.
Kobayashi, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Water sparger for a boiling water reactor. 4,576,784, Cl. 376-352.000.
Kobayashi, Minoru, to Olympus Optical Co., Ltd. Word line number count/display device for tape recorder. 4,577,252, Cl. 360-137.000.
Kobayashi, Osamu; Tanaka, Masanori; and Ishii, Jun, to Kabushiki Kaisha Nipponcoinco. Coin discrimination apparatus. 4,576,275, Cl. 194-203.000.
Kobayashi, Seiichi: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Kobayashi, Yasuhiro: *See*—
Inokuti, Yukio; Kobayashi, Yasuhiro; and Ito, Yo, 4,576,658, Cl. 148-1[illegible].0.
Koblanski, John N., to Ocean Ecology Ltd. Apparatus to remove oil slicks. 4,576,569, Cl. 431-1.000.
Koch, Manfred; Muhlhaus, Ludwig; Lambach, Rolf; and Grochowski, Horst, to UHDE GmbH. Process for the desorption of spent solid absorbent. 4,576,924, Cl. 502-56.000.
Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., to Sutter Biomedical, Inc. Continuous passive motion hand device. 4,576,148, Cl. 128-26.000.
Koga, Keiko: *See*—
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,577,132, Cl. 310-800.000.
Kogane, Mikio; and Nishimura, Mizuho, to Fuji Photo Film Co., Ltd. Photographic printing apparatus. 4,576,471, Cl. 355-50.000.
Kogane, Mikio; Nishimura, Mizuho; and Yamamoto, Takashi, to Fuji Photo Film Co., Ltd. Photographic printing apparatus. 4,576,473, Cl. 355-68.000.
Kohl, Paul A.; Smith, Lawrence E.; and Trop, Harvey S., to AT&T Bell Laboratories. Etching optical surfaces on GaAs. 4,576,691, Cl. 204-129.300.
Kohler Co.: *See*—
Rozek, Roy J., 4,575,881, Cl. 4-405.000.
Kohnen, Julius: *See*—
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.
Kohnlechner, Rainer, to Ermeto Armaturen GmbH. Pressure sensor with ringed chamber. 4,576,049, Cl. 73-706.000.
Kohtaki & Co., Ltd.: *See*—
Yamato, Yoshiharu, 4,576,092, Cl. 100-218.000.
Koike, Akinobu: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,576,893, Cl. 430-457.000.
Koike, Hideharu, to Kabushiki Kaisha Toshiba. CMOS Logic circuit. 4,577,124, Cl. 307-451.000.
Kojima, Tadashi: *See*—
Kobayashi, Akira; and Kojima, Tadashi, 4,577,155, Cl. 328-164.000.
Koken, Karel G. M.; van de Kerkhof, Hubertus F. W.; Olierook, John C. J.; and Beyersbergen van Henegouwen, Cornelis M., to U.S. Philips Corporation. Magnetic-tape cassette with a latching cover plate. 4,576,345, Cl. 242-198.000.
Kokubu, Gozi: *See*—
Tsurushima, Masaaki; Kokubu, Gozi; and Moriya, Koji, 4,577,012, Cl. 536-24.000.
Kolbas, Robert M.: *See*—
Carney, James K.; and Kolbas, Robert M., 4,577,321, Cl. 372-50.000.
Kolodny, Avi: *See*—
Eitan, Boaz; Kolodny, Avi; Amrany, Daniel; and McCreary, James, 4,577,295, Cl. 365-218.000.
Kolve, Gerald C. Reinforced saw chain tooth. 4,576,078, Cl. 83-833.000.
Kondo, Edward S.: *See*—
Puritch, George S.; and Kondo, Edward S., 4,576,950, Cl. 514-358.000.
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Apparatus with polarographic sensor to detect concentrations of plurality of gas components. 4,576,705, Cl. 204-406.000.
Kone Oy: *See*—
Kahilathi, Matti; Ventola, Keijo; Virtanen, Matti; and Huhta, Pentti, 4,576,327, Cl. 228-212.000.
Konigshofen, Heinrich: *See*—
Buding, Hartmuth; Konigshofen, Heinrich; Szentivanyi, Zsolt; and Thormer, Joachim, 4,576,992, Cl. 525-211.000.
Konishi, Takao: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, 4,576,956, Cl. 514-380.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Fukuchi, Masakazu; and Oishi, Keiji, 4,576,466, Cl. 355-3.0DD.
Goto, Sohei; and Okauchi, Ken, 4,576,909, Cl. 430-546.000.
Hirose, Naohiro; Sasaki, Osamu; and Takizawa, Yoshio, 4,576,886, Cl. 430-59.000.
Koyama, Mikio; Okaniwa, Kenichiro; and Saruhashi, Masakuni, 4,576,793, Cl. 422-56.000.
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.
Murakami, Kiyotaka; and Kimura, Yoshiaki, 4,577,201, Cl. 346-140.00R.
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.
Koppers, Manfred: *See*—
Heintzmann, Peter; Koppers, Manfred; Bohnes, Karlheinz; and Hecken, Gerhard, 4,576,524, Cl. 405-260.000.
Koppl, Georg: *See*—
Blahous, Leopold; and Koppl, Georg, 4,577,253, Cl. 361-62.000.
Korenko, Michael K.: *See*—
Bates, John F.; Brager, Howard R.; and Korenko, Michael K., 4,576,641, Cl. 75-128.00P.
Korotaev, Jury P.: *See*—
Alkhazov, Tofik G. O.; Korotaev, Jury P.; and Vartanov, Albert A., 4,576,925, Cl. 502-307.000.

Korsch, Dietrich G., to Boeing Company, The. Compact, single piece laser beam analyzer. 4,576,447, Cl. 350-444.000.

Korsky, Vincent V.; and Laotetpitaks, Chansak, to TIE/Communications, Inc. Station interface for digital electronic telephone switching system having centralized digital audio processor. 4,577,310, Cl. 370-58.000.

Kortenback & Rauh KG: *See*—
Schultes, Tilmann; and Seidel, Joachim, 4,576,191, Cl. 135-30.000.

Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Lock-up clutch of a torque converter. 4,576,260, Cl. 192-3.310.

Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Intermediates for spiro[2H-1,4-benzodioxepin-3(5H)4'piperidine] compounds. 4,577,026, Cl. 546-216.000.

Koster, William H.: *See*—
Zahler, Robert; Koster, William H.; and Slusarchyk, William A., 4,576,749, Cl. 260-239.00A.

Kostinko, John A., to J. M. Huber Corporation. Rubber compositions containing small particle size zeolites and mixtures. 4,576,986, Cl. 524-450.000.

Kot, Norbert J., II: *See*—
Horn, Edward R.; and Kot, Norbert J., II, 4,576,367, Cl. 269-32.000.

Kotera, Yoshikazu: *See*—
Yoshida, Fumio; and Kotera, Yoshikazu, 4,576,027, Cl. 72-11.000.

Koutz, Stanley L., to GA Technologies Inc. Heat pump augmentation of nuclear process heat. 4,576,783, Cl. 376-323.000.

Kovacs, Janos: *See*—
Tamas, Istvan; Riederauer, Szilard; and Kovacs, Janos, 4,576,637, Cl. 75-10.00R.

Koyama, Mikio; Okaniwa, Kenichiro; and Saruhashi, Masakuni, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,576,793, Cl. 422-56.000.

Koyama, Mototsugu: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,576,863, Cl. 428-325.000.

Kozai, Shinji; Shiiba, Suenobu; and Higashitani, Yoshitaka, to Kawasaki Steel Corporation. Metal strip edge grinding apparatus. 4,575,970, Cl. 51-165.920.

Kozponti Valto-Es Hitelbank RT: *See*—
Valeria, Hidvegi, 4,576,353, Cl. 248-165.000.

Kozuka, Nobuhiko: *See*—
Sakata, Hiromi; Kozuka, Nobuhiko; and Hiraoka, Hiroshi, 4,576,464, Cl. 355-3.00R.

Krafft, Terry E.: *See*—
Collins, Terrence J.; Anson, Fred C.; Gipson, Stephen L.; and Krafft, Terry E., 4,577,042, Cl. 564-158.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Mathewes, Wolfgang; Fitzner, Klaus; and Plitt, Uwe, 4,576,088, Cl. 98-119.000.

Krasnikov, Valery V.: *See*—
Gubiev, Jury K.; Krasnikov, Valery V.; Bakulin, Valentin P.; Gagarin, Mikhail A.; Ivanov, Vladimir V.; and Kishkovsky, Zbignev N., 4,576,824, Cl. 426-241.000.

Kraus, Charles E., to Excelermatic Inc. Method of treating traction surfaces. 4,575,910, Cl. 29-148.40D.

Kraus, Charles E., to Excelermatic, Inc. Hydraulically controlled infinitely variable traction roller transmission. 4,576,055, Cl. 74-200.000.

Kraus, Robert G.; Kunica, Enora S.; and Praderio, Joseph J., to Codman & Shurtleff, Inc. Trocar. 4,576,589, Cl. 604-8.000.

Krause, A. Frank, Jr. Electric gaslight simulative. 4,577,265, Cl. 362-255.000.

Krautter, Jurgen; and Dzialas, Willi, to Rohm GmbH Chemische Fabrik. Water spreading plastic material, method for its manufacture and its use as a glazing and roofing material. 4,576,864, Cl. 428-328.000.

KRC Inc.: *See*—
Krotchko, Daniel J., 4,576,845, Cl. 428-36.000.

Kreeft, Eugene H.: *See*—
Webb, Robert E.; Kreeft, Eugene H.; and Arnold, Jack T., 4,577,060, Cl. 179-2.0EC.

Kreisher, John H.; and Nalbantian, Charles A., to International Biotechnologies, Inc. Nucleic acid sequencing electrophoresis apparatus and method of fabricating. 4,576,693, Cl. 204-180.100.

Kreisher, John H.: *See*—
Peck, Lawrence J.; and Kreisher, John H., 4,576,702, Cl. 204-299.00R.
Peck, Lawrence J.; Kreisher, John H.; and Walker, Alan L., 4,576,703, Cl. 204-299.00R.

Krempl, Peter W.; and Schindler, Wolfgang, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik; and List, Hans. Method of determining masses of absorbing components of a sample in a test volume and a device for implementation of this method. 4,577,105, Cl. 250-343.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. β-Substituted polyfluoroethyl compounds. 4,576,752, Cl. 260-349.000.

Kriedt, Hans; and Fenk, Josef, to Siemens Aktiengesellschaft. Integrable frequency divider circuit having a feedback controlled differential amplifier as its preamplifier circuit. 4,577,336, Cl. 377-111.000.

Krishnakumar, Suppayan M.: *See*—
Beck, Martin H.; and Krishnakumar, Suppayan M., 4,576,843, Cl. 428-35.000.

Krotchko, Daniel J., to KRC Inc. Thermally conductive base layers for cast polyurethane roll covers. 4,576,845, Cl. 428-36.000.

Kruger, Robert A.; and Nelson, James A., to Thomson-CSF Broadcast, Inc. Apparatus and method for cross sectional imaging of a body. 4,577,222, Cl. 358-111.000.

Krupotich, Edward A.: *See*—
Bingham, George H.; Krupotich, Edward A.; and Rosensweig, Burton J., 4,576,287, Cl. 209-601.000.

Krupp Polysius AG: *See*—
Goldmann, Wolf, 4,576,644, Cl. 106-100.000.

Krzyston, John F.: *See*—
Jarrett, Steve A.; and Krzyston, John F., 4,576,289, Cl. 209-631.000.

Kubick, Frederick, to United Technologies Corporation. Variable fresnel lens device. 4,576,441, Cl. 350-355.000.

Kubo, Masaharu: *See*—
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.

Kucera, Richard J. Pipe-vibration reducer. 4,576,356, Cl. 248-559.000.

Kuchelmeister, Reinhold: *See*—
Humpolik, Bohumil; Kluna, Vlastimil; Winterer, Wilfried; Kuchelmeister, Reinhold; and Bayer, Jurgen, 4,576,223, Cl. 165-79.000.

Kuchera, Ray A.: *See*—
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,576,767, Cl. 264-12.000.

Kuchyt, James R.; and High, Paul G., to KMW Products Limited. Knock-down construction for front end loader. 4,576,543, Cl. 414-722.000.

Kudo, Koichi: *See*—
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, 4,577,141, Cl. 318-590.000.

Kuech, Thomas F.: *See*—
Hovel, Harold J.; and Kuech, Thomas F., 4,576,652, Cl. 148-1.500.

Kugler, Artur: *See*—
Reppert, Rudi; Zaunberger, Franz X.; and Kugler, Artur, 4,576,062, Cl. 74-740.000.

Kuhlein, Klaus: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Kuhlein, Klaus; Keller, Reinhold; Schlingmann, Merten; and Hess, Gerhard, 4,576,973, Cl. 521-149.000.

Kuhn, Friedrich: *See*—
Scheuter, Siegbert; and Kuhn, Friedrich, 4,576,343, Cl. 242-66.000.

Kulzer & Co., GmbH: *See*—
Schaefer, Roland, 4,576,976, Cl. 522-16.000.

Kummli, Paul: *See*—
Woods, John W.; Kummli, Paul; and White, Edward M., 4,577,307, Cl. 369-270.000.

Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, to Nissan Motor Co., Ltd. Control system for hydraulic automatic clutch. 4,576,265, Cl. 192-0.055.

Kung, Andrew H., to University of California, The Regents of the. Method and apparatus for generation of coherent VUV and XUV radiation. 4,577,122, Cl. 307-425.000.

Kunica, Enora S.: *See*—
Kraus, Robert G.; Kunica, Enora S.; and Praderio, Joseph J., 4,576,589, Cl. 604-8.000.

Kunzli, Albert, to Sulzer Brothers Limited. Tray electrode arrangement for an electrical steam or hot water generator. 4,577,091, Cl. 219-284.000.

Kurahashi, Yoshio, to Nippon Optical Fiber Co., Ltd. Packaging tape. 4,576,854, Cl. 428-204.000.

Kuraray Co., Ltd.: *See*—
Tanaka, Yoshinari; Aoyama, Akimasa; Moritani, Takeshi; Satoh, Kenji; and Okaya, Takuji, 4,576,988, Cl. 524-503.000.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Kobayashi, Hiroyasu; Fukui, Masayuki; and Nomoto, Shosaku, 4,576,672, Cl. 156-177.000.

Kurata, Masami, to Fuji Xerox Co., Ltd. Color separating circuit for producing red and black signals. 4,577,218, Cl. 358-75.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kanda, Yoichi; Satake, Keigo; Shinkawa, Hiroyasu; and Yamazaki, Shiro, 4,577,029, Cl. 548-162.000.

Kuriyama, Shizuo; and Saitoh, Mikio, to Eisai Co., Ltd.; and Mitsubishi Chemical Industries Ltd. Treatment of mental symptoms caused by organic disorder in brain. 4,576,966, Cl. 514-648.000.

Kuroda, Kazuo, to Pioneer Electronic Corporation. Demodulator with drop-out compensation and reciprocal amplifier. 4,577,158, Cl. 329-104.000.

Kuroda, Toru; and Yamawaki, Naokuni, to Asahi Kasei Kogyo Kabushiki Kaisha. Porous adsorbent for adsorbing low density lipoproteins. 4,576,927, Cl. 502-402.000.

Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, to Hitachi, Ltd. Electroconductive molybdenum paste. 4,576,735, Cl. 252-512.000.

Kurt, Prunbauer; and Csapo, Erich, to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Gesellschaft m.b.H. & Co. Kommanditgesellschaft. Cylinder lock having coupling means. 4,576,026, Cl. 70-380.000.

Kusnetz, Jacob: *See*—
Yaverbaum, Sidney; and Kusnetz, Jacob, 4,576,912, Cl. 435-7.000.

Kusters, Eduard: *See*—
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.

Kusunoki, Toshio: *See*—
Otuka, Shinpei; Kawai, Kozo; and Kusunoki, Toshio, 4,576,149, Cl. 128-33.000.

Kutz, Johannes: *See—*
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.

Kuwajima, Hideji; and Watanabe, Takeyoshi, to Hitachi Chemical Company, Ltd. Reconstituted mica materials, reconstituted mica prepreg materials, reconstituted mica products and insulated coils. 4,576,856, Cl. 428-241.C90.

Kuznetsova, Svetlana M.: *See—*
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.

Kyocera Corporation: *See—*
Hayashi, Isao, 4,577,170, Cl. 333-205.000.

Kyowa Chemical Industry Co., Ltd.: *See—*
Miyata, Shigeo; and Nosu, Tsutomu, 4,576,819, Cl. 424-156.000.

L. & C. Steinmuller GmbH: *See—*
Keintzel, Gunter; and Westebbe, Klaus, 4,576,125, Cl. 122-483.000.

La Telemecanique Electrique: *See—*
Hardouin, Pierre; Lameyre, Felix; and Paris, Claude, 4,576,429, Cl. 339-95.00D.

Laapotti, Jorma, to Valmet Oy. Long-nip press for a paper making machine. 4,576,682, Cl. 162-358.000.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,576,944, Cl. 514-238.000.

Laclede Professional Products, Inc.: *See—*
Montgomery, Robert E.; and Pellico, Michael A., 4,576,817, Cl. 424-94.000.

Lade, Robert W.: *See—*
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,577,052, Cl. 136-246.000.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,577,208, Cl. 357-23.400.

Lafa, Jury I.: *See—*
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.

Lafon, Louis, to Laboratoire L. Lafon. 4-Ethyl-2-hydroxy-3-methyl-2-phenylmorpholine, compositions and use. 4,576,944, Cl. 514-238.000.

Lahoda, Edward J.; and Eckhardt, David A., to Westinghouse Electric Corp. Workpiece positioning apparatus with plural sensors. 4,576,123, Cl. 122-382.000.

LaHue, Ronald L.: *See—*
Rau, Jim L.; and LaHue, Ronald L., 4,576,003, Cl. 60-384.000.

Laiewski, Stanislaus; Hessen, Thomas A.; Hardy, Thomas R.; and Gilvin, Allie F., to W. R. Grace & Co., Cryovac Div. Purge trap tray. 4,576,278, Cl. 206-204.000.

Laimkuhler, Jürgen: *See—*
Hegemann, Karl-Rudolf; Weissert, Helmut; and Laimkuhler, Jurgen, 4,576,803, Cl. 423-242.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Moufflet, Luc; Roux, Michel; and Valadier, Jean, 4,576,571, Cl. 432-9.000.

Lalin, Hill S. Dual mode gas sampler and pneumatic flow control system. 4,576,054, Cl. 73-863.030.

Lam, Wim J.; Devries, Luitzen; McKinnon, Gordon M.; and Baribeau, Jean J., to CAE Electronics, Ltd. Blended mode concept for control of flight simulator motion systems. 4,576,577, Cl. 434-58.000.

Lamb-Weston, Inc.: *See—*
Rayment, Arthur G., 4,576,071, Cl. 83-71.000.

Lambach, Rolf: *See—*
Koch, Manfred; Muhlhaus, Ludwig; Lambach, Rolf; and Grochowski, Horst, 4,576,924, Cl. 502-56.000.

Lambert, David K., to General Motors Corporation. Thermal diffusion fluid flow sensor. 4,576,050, Cl. 73-861.050.

Lambert, George F., to General Motors Corporation. Robot hand for lifting apertured panel. 4,576,407, Cl. 294-97.000.

Lambert, James L., to Westinghouse Electric Corp. Method and apparatus for measuring temperature profile with a single optical fiber. 4,576,485, Cl. 374-130.000.

Lameyre, Felix: *See—*
Hardouin, Pierre; Lameyre, Felix; and Paris, Claude, 4,576,429, Cl. 339-95.00D.

Lamico, Pierre: *See—*
Colmet, Robert; Naslain, Roger; Hagenmuller, Paul; and Lamico, Pierre, 4,576,836, Cl. 427-255.000.

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Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, 4,576,717, Cl. 210-610.000.

Lane, E. James; Holmes, Russell C.; and Markyvech, Ronald K., to Eaton Corporation. Clutch control. 4,576,263, Cl. 192-0.044.

Lane, E. James: *See—*
Speranza, Donald; Lane, E. James; and Markyvech, Ronald K., 4,576,065, Cl. 74-866.000.

Lane, Edward S., to United Kingdom Atomic Energy Authority. Preparation of dispersions and ceramics from hydrated metal oxides. 4,576,921, Cl. 501-12.000.

Lane, Thomas: *See—*
Rosen, Murray; and Lane, Thomas, 4,576,838, Cl. 427-385.500.

Lange, Gottfried: *See—*
Diepers, Heinrich; Feigt, Ingmar; and Lange, Gottfried, 4,577,108, Cl. 250-370.000.

Lange International S.A.: *See—*
Arieh, Simon; and Courvoisier, Guy, 4,575,958, Cl. 36-121.000.

Langen, Hans: *See—*
Kampfer, Helmut; Langen, Hans; and Ranz, Erwin, 4,576,907, Cl. 430-507.000.

Langley, James: *See—*
McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.

Langston, Ralph C. Method for pulling long runs of fiber optic cable. 4,576,362, Cl. 254-134.3FT.

Lanier, Robert L., to Garden City Fan & Blower Co. Vortex generator for centrifugal fans. 4,576,549, Cl. 415-209.000.

Laotetpitaks, Chansak: *See—*
Korsky, Vincent V.; and Laotetpitaks, Chansak, 4,577,310, Cl. 370-58.000.

LaPelle, Ronald J.: *See—*
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., 4,576,303, Cl. 220-89.00A.

Lapham, James M.: *See—*
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,576,098, Cl. 104-172.00B.

Larkin, John J.: *See—*
Armington, Alton F.; and Larkin, John J., 4,576,808, Cl. 423-335.000.

Larkin, Mark E.: *See—*
Levin, Harold A.; and Larkin, Mark E., 4,576,602, Cl. 604-408.000.

Larsen, Walter L. Hook fastening device. 4,575,906, Cl. 24-238.000.

Larson, Curtis L., to Minnesota Mining and Manufacturing Company. Tamper resistant closure. 4,576,297, Cl. 215-250.000.

Larson, Lynn D. Fiberous wave-dampening apparatus. 4,575,886, Cl. 5-450.000.

Larson, Mikiel L.; and Toy, Wing N., to AT&T Bell Laboratories. Multiplexed interconnection of packet switching node packages. 4,577,308, Cl. 370-9.000.

Laszlo, Fiak; Sandor, Derzsenyi; and Sandor, Darin, to Magyar Gordulocsapagy Muvek. Roller shoe structure. 4,576,422, Cl. 308-6.00C.

Laszlo, Oliver J., to Abdite Industries, Inc. Method and apparatus for constructing turbine components. 4,575,911, Cl. 29-156.80B.

Latasiewicz, Leonard; Melikian, Felix B.; and Estes, Bay E., III, to Motorola, Inc. Apparatus and method for retaining an electronic device. 4,577,259, Cl. 361-400.000.

Lauer, Reinhard; and Hartmann, Werner, to Erwin Sick GmbH Optik-Elektronik. Apparatus for determining the transit time of ultrasonic pulses in a fluid. 4,576,047, Cl. 73-597.000.

Launder, Richard L. Scarifier tooth assembly. 4,576,239, Cl. 172-751.000.

Lauren, Henning J. E. Pipe insulation sleeve. 4,576,206, Cl. 138-149.000.

Lautenschlager, Peter, to Keiper Dynavit GmbH & Co. Ergometer having an eddy current brake serving as a loading device. 4,576,051, Cl. 73-862.360.

Law, Hung-Fai S., to AT&T Bell Laboratories. Programmed logic array with auxiliary pull-up means to increase precharging speed. 4,577,190, Cl. 340-825.830.

Lawrence, Ronald L.: *See—*
Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., 4,576,148, Cl. 128-26.000.

Laxton, Raymond; and Smith, Peter E., to AGB Research PLC. Arrangement for detecting to which channel a television set is tuned. 4,577,220, Cl. 358-84.000.

Le Bland Makino Machine Tool Co.: *See—*
Bazuin, Johannes, 4,576,069, Cl. 82-2.00R.

Lear Siegler, Inc.: *See—*
Kinne, Stanley F., 4,576,398, Cl. 280-789.000.

LeBlanc, Richard S., to General Motors Corporation. Slip ring assembly. 4,576,085, Cl. 89-36.130.

Lecinski, Frank H., to Continental White Cap, Inc. Combination radial locking device and infestation seal for press-seal type transfer neck finish. 4,576,296, Cl. 215-31.000.

Lecinski, Frank H., Jr., to Continental White Cap, Inc. Closure cap with improved top-load leakage resistance. 4,576,299, Cl. 215-318.000.

Le Count, David J., to Imperial Chemical Industries PLC. Quinoline derivatives. 4,576,953, Cl. 514-312.000.

Lee, Carol S.: *See—*
Kaeding, Warren W.; and Lee, Carol S., 4,577,050, Cl. 585-486.000.

Lee, Mark C.: *See—*
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,576,926, Cl. 502-339.000.

Lee, Raymond; and Ferro, Gregory A., to Imi-Tech Corporation. Polyimide laminant and process for the preparation of same. 4,576,862, Cl. 428-317.700.

Lee, Wen Y.: *See—*
Barton, Roger W.; Coufal, Hans J.; Jipson, Victor B.; and Lee, Wen Y., 4,576,895, Cl. 430-270.000.

Lehman, Richard F., to Xerox Corporation. Illumination system for an electrophotographic printing device. 4,576,462, Cl. 355-14.00R.

Lehmann, Wolfgang; and Aab, Hans-Walter, to Neff Gewindespindeln GmbH. Linear bearing arrangement for guiding a carriage in a straight line along a guide rail. 4,576,420, Cl. 308-6.00C.

Leiber, Heinz, to Robert Bosch GmbH. Vehicle anti-skid or anti-brake-lock system, and brake control method. 4,576,419, Cl. 303-100.000.

Lemke, Timothy A., to Du Pont de Nemours, E. I., and Company. Process for locating and connecting individual conductors in a multilayer concentric lay cable. 4,576,662, Cl. 156-52.000.

Lemmer, Helmut, to Square D Starkstrom GmbH. Electromagnet for electric switching device. 4,577,174, Cl. 335-261.000.

Lenoir, Jacques A. Infrared cooking apparatus with adjustable height and pivotal heating element and with pivotal side flaps. 4,577,092, Cl. 219-354.000.

Lenz, Werner: *See*—
Hoffmann, Gerhard; Kleuser, Dieter; and Lenz, Werner, 4,576,898, Cl. 430-306.000.

Lenzi, Mauro. Service unit intended to continuously supply a high-speed printer with preformed support packages. 4,576,673, Cl. 156-350.000.

Lenzing, Richard S., to Superior Electric Company, The. Variable autotransformer having an indexed stepping brush. 4,577,146, Cl. 323-341.000.

Leone, Ronald E.: *See*—
Gunther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, 4,576,905, Cl. 430-401.000.

Lepisto, J. George, to Champion International Corporation. Duck bill filler nozzle. 4,576,210, Cl. 141-115.000.

Lerner, Hershey, to Automated Packaging Systems, Inc. Poultry holding mechanism with improved wing hooks. 4,575,901, Cl. 17-11.000.

Leschik, Wolfgang: *See*—
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, 4,577,200, Cl. 346-140.00R.

Le Tarte, Walter. Masking tape dispenser. 4,576,674, Cl. 156-463.000.

Lettvin, Jerome Y.; and Plotkin, George M., to Rines, Robert H., a part interest. Method of and apparatus for low noise current amplification. 4,577,160, Cl. 330-149.000.

Lever Brothers Company: *See*—
Edwards, Robert J.; and Hardman, Paul D., 4,576,744, Cl. 252-554.000.

Levin, Harold A.; and Larkin, Mark E., to Abbott Laboratories. Blow molded container with integral administration port. 4,576,602, Cl. 604-408.000.

Levine, Herbert R.; Gerrato, Stephen G.; and Poulin, Benoit L., to Essex Group, Inc. Texturized heat shrinkable tubing having radial and longitudinal shrinkage memory. 4,576,207, Cl. 138-177.000.

Levy, Aaron I., to Baffes, Thomas G., a part interest. External pulmonary brace and method for using same. 4,576,155, Cl. 128-132.00R.

Levy, Alfred; and Paul, Jon D. Remotely controlled telephone hold program system. 4,577,067, Cl. 179-99.00H.

Levy, Stephen; O'Connell, Joseph C.; Wright, William H., Jr.; and Weiner, Maurice, to United States of America, Army. High power optical switch for microsecond switching. 4,577,114, Cl. 250-551.000.

Lew, Hyok S. Floating disc butterfly valves. 4,576,360, Cl. 251-162.000.

Lewis, Kenneth A.; and Alpern, Alan N., to GridComm Inc. Composite shift keying communication system. 4,577,333, Cl. 375-45.000.

Lewis, Robert K.; and Ray, Sudipta K., to International Business Machines Corporation. Process for inhibiting metal migration during heat cycling of multilayer thin metal film structures. 4,576,659, Cl. 148-127.000.

Leyman Manufacturing Corp.: *See*—
Dunn, Jeffery L.; and Durham, Michael W., 4,576,541, Cl. 414-545.000.

Licciardello, Michael: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,576,741, Cl. 252-522.00R.

Liebler, Ralf; Besecke, Siegmund; and Munzer, Manfred, to Rohm GmbH. Method for making multilayered resin bodies having UV-protection and the resultant products. 4,576,870, Cl. 428-515.000.

Lieder, Bernhard: *See*—
Kalbfell, Heinz; Lieder, Bernhard; and Mercamp, Herbert, 4,577,043, Cl. 568-454.000.

Lift-U-Inc.: *See*—
Williams, Harold R., 4,576,539, Cl. 414-391.000.

Light, Glenn M., to Southwest Research Institute. X-Ray fluorescence testing of laminate structures. 4,577,337, Cl. 378-044.000.

Lightolier Incorporated: *See*—
Donato, Anthony C.; and Kartavenko, Alex, 4,577,266, Cl. 362-296.000.

Lillard, Robert M. Fireplace apparatus for sliding door aperture. 4,576,141, Cl. 126-120.000.

Lin, Patrick. Electronic digital tape-rule. 4,575,944, Cl. 33-138.000.

Lin, Tom F.: *See*—
Proud, Todd A.; Lin, Tom F.; Mitchell, Wayne J.; and Kasper, James D., 4,576,185, Cl. 128-760.000.

Lin, Yang-i: *See*—
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,577,018, Cl. 544-225.000.

Lindorfer, Walter; and Jahn-Held, Wilhelm, to Wintershall AG. Process for terminal storage of pumpable wastes. 4,576,513, Cl. 405-128.000.

Lindsay-Scott, David J.: *See*—
Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J., 4,576,159, Cl. 128-203.140.

Ling, Daniel T.: *See*—
Matick, Richard E.; and Ling, Daniel T., 4,577,293, Cl. 365-189.000.

Lingemann, Horst, to Helmut Lingemann GmbH & Co. Desiccant application for double-glazed windows, etc. and a spacer section filled with the desiccant application. 4,576,841, Cl. 428-34.000.

Lion Corporation: *See*—
Suganuma, Nobuo; Anzai, Masafumi; Takada, Nobuyuki; and Ichikawa, Hiromichi. 4,576,816, Cl. 424-50.000.

Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z. Multipass corrosion-proof air preheater. 4,576,226, Cl. 165-134.100.

Lipner, Harry, to Florida State University. Sanitary pads for men. 4,576,599, Cl. 604-390.000.

Lipp, Helmut: *See*—
Reinhardt, Wilhelm; and Lipp, Helmut, 4,577,139, Cl. 318-254.000.

Lipscher, Bernard; and Coleman, Kevin G. Alarm system for electric range. 4,577,181, Cl. 340-522.000.

Liptak, Frank J.: *See*—
Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., 4,577,197, Cl. 346-75.000.

List, Hans: *See*—
Krempl, Peter W.; and Schindler, Wolfgang, 4,577,105, Cl. 250-343.000.

Liu, Richard T.; Nickerson, Winston R.; and Anderson, Charles H., to Nestec S. A. Process for the preparation of flavorant capsules. 4,576,826, Cl. 426-289.000.

Ljungkvist, Stig-ake; and Johansson, Lennart. Technique for the location of expansion joints when casting a concrete bed. 4,576,510, Cl. 404-49.000.

Loch, Werner: *See*—
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,576,979, Cl. 523-404.000.

Loechelt, Cecil P., II, to Ethyl Corporation. Production of zeolite Y. 4,576,807, Cl. 423-329.000.

Logan, Ralph A.; and Tsang, Won-Tien, to AT&T Bell Laboratories. Method of making heteroepitaxial ridge overgrown laser. 4,575,919, Cl. 29-569.00L.

Lohstroh, Jan: *See*—
Van Den Crommenacker, Johannes D. P.; and Lohstroh, Jan, 4,577,123, Cl. 307-446.000.

Loiseaux, Brigitte: *See*—
Huignard, Jean P.; Rajbenbach, Henri; Loiseaux, Brigitte; and Herriau, Jean P., 4,576,434, Cl. 350-3.640.

Loizeau, Pierre, to Valeo. Centrifugal actuator device, in particular for a clutch disk assembly. 4,576,267, Cl. 192-70.170.

Lomovsky, Oleg I.: *See*—
Makkaev, Almaxud M.; Lomovsky, Oleg I.; Mikhailov, Jury I.; and Boldyrev, Vladimir V., 4,576,689, Cl. 204-20.000.

Longoria, Heron. Trailer hitch mounted tool support. 4,576,395, Cl. 280-511.000.

Loose, Robert A., to Westinghouse Electric Corp. Nuclear reactor loss of coolant protection system. 4,576,782, Cl. 376-282.000.

Lopez, Armando M.: *See*—
Cabral, Chavelo; Dean, Donald E.; and Lopez, Armando M., 4,575,879, Cl. 4-253.000.

Lorck, Henning O. B.; and Rasmussen, Poul R. Antibiotic heterocyclic oxygen compounds and use. 4,576,961, Cl. 514-462.000.

Lott, Hamilton, Jr.; and Strock, Lynn E., to Nucor Corporation. Sliding hold-down clip for standing seam metal roof. 4,575,983, Cl. 52-544.000.

Lotter, Manfred: *See*—
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Lowke, George E.; and Meltzer, Robert J., to Akzo N.V. Electro-optical apparatus for microbial identification and enumeration. 4,576,916, Cl. 435-289.000.

Lucas Industries: *See*—
Ward, Melvyn, 4,576,872, Cl. 428-550.000.

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Silcock, Terence M. B.; and Timms, Colin T., 4,576,133, Cl. 123-458.000.
Wootton, Malcolm J.; and Harris, Ivor R., 4,576,640, Cl. 75-123.00E.

Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., to Robertshaw Controls Company. Pneumatic control system, control means therefor and method of making the same. 4,576,194, Cl. 137-84.000.

Lucente, Samuel A.: *See*—
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Luckas, Bruno: *See*—
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Luetzelschwab, Wayne E., to Marathon Oil Company. Method for preparing polymer solutions. 4,576,978, Cl. 523-313.000.

Lui, Peter K.: *See*—
Keyes, Marion A., IV; Lui, Peter K.; and Malcolm, Jack W., deceased, 4,577,097, Cl. 250-211.00K.

Luigi Stoppani S.p.A.: *See*—
Bruschi, Enrico, 4,577,019, Cl. 544-264.000.

Lukenbach, Elvin R.: *See*—
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Lulay, John R., to Dynascan Corporation. Telephone equipment tester. 4,577,072, Cl. 179-175.10R.

Lunn, William H. W.; and Vasileff, Robert T., to Eli Lilly and Company. Thieno and furopyridinium-substituted cephalosporins. 4,577,014, Cl. 544-022.000.

Lunt, James; MacPherson, Edwin J.; and Meunier, Paul J., to Fiberglas Canada, Inc. Closed cell phenolic foam. 4,576,972, Cl. 521-136.000.

Lupo, Giorgio; Capra, Pier C.; and Marcarino, Aldo, to S.O.M., S.p.A. Servo clutch mechanism, and the drive gear incorporating same. 4,576,264, Cl. 192-48.910.

Luzenberg, Robert S., to Computer Air Corp. Evaporative cooler. 4,576,012, Cl. 62-157.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Schmidt, Alfred; and Flachenecker, Gerhard, 4,577,140, Cl. 318-587.000.
Stieber, Michael; Meinke, Peter; and Dreher, Gunther, 4,576,246, Cl. 180-168.000.

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M. Faensen: *See*—
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Maack, Werner; Kampfmann, Georg; and Foerster, Peter, to AMP Incorporated. Crimping press capable of crimping terminals onto a range of wire sizes. 4,576,032, Cl. 72-431.000.

Maack, Werner: *See*—
Joos, Manfred; and Maack, Werner, 4,575,932, Cl. 29-751.000.

MacBride, William R.; Magee, James A.; Armiger, William B.; and Zabriskie, Dane W., to BioChem Sensors, Inc. Optical apparatus and method for measuring the characteristics of materials by their fluorescence. 4,577,110, Cl. 250-461.200.

MacDonald, Peter, to Sterosynt Ltd. 6α-Fluoro-9α-chloro-prednisolone 17,21-diesters. 4,576,936, Cl. 514-180.000.

MacDowell, John F., to Corning Glass Works. B_2O_3—P_2O_5—SiO_2 glass-ceramics. 4,576,920, Cl. 501-10.000.

Machell, Greville, to Milliken Research Corporation. Method for making a hot melt adhesive bonded pile fabric. 4,576,665, Cl. 156-72.000.

Machin, Peter J., to Hoffmann-La Roche Inc. Azolyl-substituted phenoxy-aminopropanol derivatives. 4,577,030, Cl. 548-255.000.

Machine Products Corporation: *See*—
McDermott, Charles; and Zafar, Magbool A., 4,575,976, Cl. 52-118.000.

MacIntosh, John A.: *See*—
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Mack, Gerhard: *See*—
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Mack, Kurt: *See*—
Reischl, Artur; and Mack, Kurt, 4,576,718, Cl. 210-616.000.

Macovski, Albert. Selective material projection imaging system using nuclear magnetic resonance. 4,577,152, Cl. 324-309.000.

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Macrovision: *See*—
Ryan, John O., 4,577,216, Cl. 358-19.000.

Maeda, Kenji, to Hitachi, Ltd. Wrist of robot. 4,576,545, Cl. 414-735.000.

Machara, Atsushi: *See*—
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Maekawa, Kouji: *See*—
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Magar, Surendar S.: *See*—
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Magee, James A.: *See*—
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Maglica, Anthony. Miniature flashlight. 4,577,263, Cl. 362-187.000.

Magura, Donald D.: *See*—
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Magyar Gordulocsapagy Muvek: *See*—
Laszlo, Fiak; Sandor, Derzsenyi; and Sandor, Darin, 4,576,422, Cl. 308-6.00C.

Mailfert, Alain-Jacques, to Institut National Polytechnique de Lorraine. Synchronous electric machine with superconductive field windings. 4,577,126, Cl. 310-52.000.

Makino, Hiroshi; and Shinohara, Shigeyuki. Pallet transport apparatus. 4,576,099, Cl. 104-287.000.

Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, to Shionogi & Co., Ltd. Iodo propargylaminoisoxazoles as fungicides. 4,576,956, Cl. 514-380.000.

Makita, Fujio: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,576,061, Cl. 74-665.00T.

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Murata, Shouichi; Makiyama, Muneto; Omoto, Takahiro; and Yasumoto, Taizo, 4,576,840, Cl. 428-16.000.

Makkaev, Almaxud M.; Lomovsky, Oleg I.; Mikhailov, Jury I.; and Boldyrev, Vladimir V. Process for electrochemical metallization of dielectrics. 4,576,689, Cl. 204-20.000.

Makovec, Francesco: *See*—
Rovati, Luigi; Makovec, Francesco; Senin, Paolo; and Casula, Pierluigi, 4,576,951, Cl. 514-282.000.

Malandain, Michel: *See*—
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Malcolm, Elizabeth J., executrix: *See*—
Keyes, Marion A., IV; Lui, Peter K.; and Malcolm, Jack W., deceased, 4,577,097, Cl. 250-211.00K.

Malcolm, Jack W., deceased: *See*—
Keyes, Marioff A., IV; Lui, Peter K.; and Malcolm, Jack W., deceased, 4,577,097, Cl. 250-211.00K.

Maldonado, Paul: *See*—
Demangeon, Francis; Hagenbach, Germain; and Maldonado, Paul, 4,576,648, Cl. 106-269.000.

Male, Alan T.: *See*—
Braginski, Aleksander I.; and Male, Alan T., 4,575,927, Cl. 29-599.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene fine powder and preparation thereof. 4,576,869, Cl. 428-502.000.

Maltman, William R.: *See*—
Baskerville, Martin W.; Maltman, William R.; and Oliver, Stephen N., 4,576,766, Cl. 264-1.400.

Mampaey, Jozef L.: *See*—
Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., 4,576,889, Cl. 430-126.000.

Mandt, Mikkel G. Subcyclonic jet recirculation grit removal system. 4,576,720, Cl. 210-626.000.

Maneki, Satome. Chopstick holder. 4,576,408, Cl. 294-99.200.

Mann, George H., to Corning Glass Works. Method for making multifocal ophthalmic lens. 4,576,623, Cl. 65-30.140.

Mannesmann Aktiengesellschaft: *See*—
Mertin, Theodor; and Hagen, Franz S., 4,577,325, Cl. 373-101.000.

Manning, Graham P., to Smith Kline & French Laboratories Limited. Dust recovery apparatus. 4,576,619, Cl. 55-213.000.

Manus, Eugene A.; and Wiley, Paris H. Respiration and heart rate monitoring apparatus. 4,576,179, Cl. 128-671.000.

Marantette, Ruth B.: *See*—
Marantette, William F.; and Marantette, Ruth B., 4,577,113, Cl. 250-548.000.

Marantette, William F.; and Marantette, Ruth B. Two axis centering system with oscillating photocells. 4,577,113, Cl. 250-548.000.

Marathon Oil Company: *See*—
Johnson, Irvin D., 4,576,042, Cl. 73-155.000.
Luetzeischwab, Wayne E., 4,576,978, Cl. 523-313.000.

Marcarino, Aldo: *See*—
Lupo, Giorgio; Capra, Pier C.; and Marcarino, Aldo, 4,576,264, Cl. 192-48.910.

Marcato, Forrest C. Road-marking material heating system. 4,576,122, Cl. 122-26.000.

Marchais, Jean-Claude: *See*—
Tzifkansky, Guy; and Marchais, Jean-Claude, 4,576,309, Cl. 220-366.000.

Marelco Power Systems: *See*—
Burgher, Peter H.; and Marsden, Raymond F., 4,577,175, Cl. 336-61.000.

Marelco Power Systems, Inc.: *See*—
Burgher, Peter H.; and Boomer, John L., 4,577,085, Cl. 219-116.000.

Mariani, Leonardo. Bracket assembly for securing wall members. 4,575,979, Cl. 52-24.000.

Mariel, James G., to Excel Industries, Inc. Vehicle door assembly. 4,575,968, Cl. 49-502.000.

Marinak, Michael J.; and Simonson, John L., to Kalama Chemical, Inc. Production of polychlorinated pyridine mixtures by direct liquid phase chlorination of alpha-picoline. 4,577,027, Cl. 546-345.000.

Marine Shield Corp.: *See*—
Rosen, Murray; and Lane, Thomas, 4,576,838, Cl. 427-385.500.

Marish, Robert. Ladder stop. 4,576,250, Cl. 182-108.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonates exhibiting improved heat resistance. 4,576,996, Cl. 525-439.000.

Marker International Company: *See*—
Stempfhuber, Lorenz, 4,576,396, Cl. 280-612.000.

Markert, Helmut; Rogler, Wolfgang; Bendel, Wolfgang; and Alber, Friedrich, to Siemens Aktiengesellschaft. Method for impregnating and embedding electrical windings. 4,576,768, Cl. 264-27.000.

Markham, David C., to Motorola, Inc. Replicator with improved propagation performance. 4,577,290, Cl. 365-12.000.

Markyvech, Ronald K.: *See*—
Lane, E. James; Holmes, Russell C.; and Markyvech, Ronald K., 4,576,263, Cl. 192-0.044.
Speranza, Donald; Lane, E. James; and Markyvech, Ronald K., 4,576,065, Cl. 74-866.000.

Marliss Industries, Inc.: *See*—
Spencer, Michael L., 4,576,238, Cl. 172-311.000.

Marom, Dan. Rescue and glider device. 4,576,248, Cl. 182-5.000.

Marquard, Kurt: *See*—
Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, 4,576,903, Cl. 430-331.000.

Marriott, Alan G.: *See*—
McLellan, William S.; and Marriott, Alan G., 4,576,080, Cl. 84-267.000.

Marriott McLellan Limited: *See*—
McLellan, William S.; and Marriott, Alan G., 4,576,080, Cl. 84-267.000.

Marsden, Raymond F.: *See*—
Burgher, Peter H.; and Marsden, Raymond F., 4,577,175, Cl. 336-61.000.

Marshall, Hubert T., II; Vest, Eugene W.; and Villforth, Frederick J., III, to Texaco, Inc. Method and system for accurately measuring speed of a ship relative to a body of water. 4,576,476, Cl. 356-28.000.

Marsico, Joseph W., Jr.; Wright, William B., Jr.; and Press, Jeffery B., to American Cyanamid Company. N-(Substituted phenyl)-N'-[(1H-

imidazol-1-yl) and (1H-1,2,4-triazol-1-yl)alkyl]ureas. 4,576,957, Cl. 514-383.000.

Marson, Roberto, to Gretag San Marco S.p.A. Apparatus for connecting a strip of photographic paper to a flat conveyor belt. 4,576,321, Cl. 226-173.000.

Martens, Alan; Wescott, Kermit R.; and Snow, Bennie E., to Westinghouse Electric Corp. Apparatus and method for fluidly connecting a boiler into pressurized steam feed line and combined-cycle steam generator power plant embodying the same. 4,576,124, Cl. 122-406.0ST.

Martens, Horst: *See—*
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, 4,577,200, Cl. 346-140.00R.

Martens, John A., to Minnesota Mining and Manufacturing Company. Shaped plastic articles having replicated microstructure surfaces. 4,576,850, Cl. 428-156.000.

Martensson, Karl I. M., to Aktiebolaget Electrolux. Method for heat treatment of articles and arrangement for carrying out the method. 4,576,792, Cl. 422-27.000.

Martin, Guy: *See—*
Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, 4,576,717, Cl. 210-610.000.

Martin, Henry; and Fricker, Urs, to Ciba-Geigy Corporation. Oxime ethers, compositions containing them and the use thereof. 4,576,628, Cl. 71-88.000.

Martin, Lawrence L.; and Setescak, Linda L., to Hoechst Roussel Pharmaceuticals Incorporated. 6,11-Dihydro-11-oxo-dibenz[b,e]oxepin derivatives. 4,576,960, Cl. 514-450.000.

Martin, Philip T., to ITT Corporation. Lightning protection circuit for digital subscriber loop interface. 4,577,255, Cl. 361-119.000.

Martin, Pierre; and Steiner, Eginhard, to Ciba-Geigy Corporation. 5-Haloalkyl-pyridines. 4,577,028, Cl. 546-345.000.

Martin, Roy D., to Texaco Inc. Dynamic balancing means for an oil well pumping unit. 4,576,041, Cl. 73-151.000.

Marubashi, Akira, to Mitsubishi Denki Kabushiki Kaisha. Display apparatus for elevator car. 4,577,177, Cl. 340-19.00R.

Marvin Glass & Associates: *See—*
Balogh, John M.; and Terzian, Rouben T., 4,576,585, Cl. 446-199.000.

Masco Corporation: *See—*
Knapp, Alfons, 4,576,202, Cl. 137-625.170.

Mase, Yasushi: *See—*
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, 4,576,132, Cl. 123-438.000.

Mason, Thomas J.: *See—*
Kalkomey, Cynthia T.; Mason, Thomas J.; and Pann, Keh, 4,577,297, Cl. 367-24.000.

Massachusetts Institute of Technology: *See—*
Smith, Henry I.; Atwater, Harry A.; and Geis, Michael W., 4,576,676, Cl. 156-603.000.
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,576,756, Cl. 260-396.00R.

Massey, Lester G.; Clawson, Lawrence G.; and Syska, Andrew J., to Consolidated Natural Gas Service Company, Inc. Pneumatic transport and heat exchange systems. 4,575,948, Cl. 34-10.000.

Mast, Robert F.; Cichanski, William J.; Walker, Francis R.; and Magura, Donald D., to Exxon Production Research Co. Offshore platform base. 4,576,519, Cl. 405-207.000.

Mastermatic, Inc.: *See—*
Burtea, Constantin, 4,576,090, Cl. 99-443.00C.

Masuda, Kosaku: *See—*
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.

Mathewes, Wolfgang; Fitzner, Klaus; and Plitt, Uwe, to Kraftwerk Union Aktiengesellschaft. Pressure-wave protective flap (or damper). 4,576,088, Cl. 98-119.000.

Mathews, Harlan P.; and Cambier, Craig, to Storage Technology Partners II. Track pitch calibration error reduction. 4,577,301, Cl. 369-44.000.

Mathis, Bernhard: *See—*
Mathis, Paul; Mathis, Bernhard; Mathis, Franz; and Zimmerer, Wilhelm, 4,576,483, Cl. 366-65.000.

Mathis, Franz: *See—*
Mathis, Paul; Mathis, Bernhard; Mathis, Franz; and Zimmerer, Wilhelm, 4,576,483, Cl. 366-65.000.

Mathis, Paul; Mathis, Bernhard; Mathis, Franz; and Zimmerer, Wilhelm, to Mathis System-Technik GmbH. Apparatus for mixing and metering flowable solid materials. 4,576,483, Cl. 366-65.000.

Mathis System-Technik GmbH: *See—*
Mathis, Paul; Mathis, Bernhard; Mathis, Franz; and Zimmerer, Wilhelm, 4,576,483, Cl. 366-65.000.

Matick, Richard E.; and Ling, Daniel T., to International Business Machines Corporation. Distributed, on-chip cache. 4,577,293, Cl. 365-189.000.

Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, to Murata Kikai Kabushiki Kaisha. Cop transporting systems for an automatic winder. 4,576,341, Cl. 242-35.50A.

Matsui, Toshikazu: *See—*
Fushida, Akira; Hasegawa, Yuuji; and Matsui, Toshikazu, 4,576,465, Cl. 355-3.0DD.

Matsukawa, Hiroharu: *See—*
Hosoi, Noriyuki; Ikeda, Kensuke; and Matsukawa, Hiroharu, 4,576,831, Cl. 427-40.000.

Matsuki, Seiichiro, to Pioneer Electronic Corporation. Cassette recording/reproducing apparatus with an automatic loading feed roller. 4,577,246, Cl. 360-96.500.

Matsumiya, Sadayuki, to Mitutoyo Mfg. Co., Ltd. Fine feed system. 4,577,142, Cl. 318-592.000.

Matsumoto, Hiroshi: *See—*
Kita, Nobuyuki; and Matsumoto, Hiroshi, 4,576,743, Cl. 252-524.000.

Matsumoto, Masaomi: *See—*
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.

Matsumoto, Masato, to Automatic Mechanical System Engineering Co. Method and apparatus for weighing bulk materials. 4,576,243, Cl. 177-119.000.

Matsumoto, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic impact device. 4,576,240, Cl. 173-105.000.

Matsumoto, Ryouhei: *See—*
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,576,588, Cl. 493-475.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ogawa, Kazufumi, 4,577,098, Cl. 250-216.000.

Matsushita Electric Works, Ltd.: *See—*
Otuka, Shinpei; Kawai, Kozo; and Kusunoki, Toshio, 4,576,149, Cl. 128-33.000.

Matsushita, Noritaka, to Kawaken Fine Chemicals Co., Ltd.; and Ajinomoto Co., Inc. Oleophilic composition comprising a powdery or granular substance having a hydrophilic surface and an aluminum chelate compound. 4,576,647, Cl. 106-193.00R.

Matsuura, Masahiro; and Aikawa, Eiichi. Folding scaffold. 4,576,251, Cl. 182-152.000.

Matsuzaka, Takashi: *See—*
Saitou, Norio; Ozasa, Susumu; and Matsuzaka, Takashi, 4,577,111, Cl. 250-492.200.

Matthes, Reinhard; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method for the production of anhydrous potassium tert.butoxide. 4,577,045, Cl. 568-851.000.

Matthews, Billie J.: *See—*
Jackson, David M.; Matthews, Billie J.; and Bornslaeger, S. Richard, 4,576,596, Cl. 604-370.000.

Matthews, Randall S., to Procter & Gamble Company, The. Prostaglandin analogues. 4,576,962, Cl. 514-530.000.

Mattson, Clyde E., to Kearney & Trecker Corporation. Tool change mechanism. 4,575,918, Cl. 29-568.000.

Matumoto, Masakazu, to Kabushiki Kaisha Nikken Kousakusho. Worm assembly. 4,576,058, Cl. 74-425.000.

Maurice, Walter F., to Allied Corporation. Method of manufacturing a bicycle hub. 4,576,325, Cl. 228-135.000.

Mavrocostas, George, to Rolls-Royce Limited. Exhaust mixer for turbofan aeroengine. 4,576,002, Cl. 60-262.000.

Mawer, John D.: *See—*
Benson, Alan M.; Mawer, John D.; and Ruzicka, Alan V., 4,576,386, Cl. 277-165.000.

May, Josephine B.: *See—*
Hurst, Jim; and May, Josephine B., 4,576,952, Cl. 514-303.000.

Mayr, Maximilian: *See—*
Fink, Roland; Mayr, Maximilian; and Schlenz, Dieter, 4,576,860, Cl. 428-314.400.

Mazaki, Shiro; and Shibata, Hiroshi, to Nitto Electric Industrial Co., Ltd. Water-soluble insulating varnish. 4,576,990, Cl. 524-602.000.

McAbery, Robert S. Sliding valve assembly. 4,576,335, Cl. 239-1.000.

McAlister, Donald R.; and Ziebold, Steven A., to Monsanto Company. Heat recovery from concentrated sulfuric acid. 4,576,813, Cl. 423-522.000.

McCaffrey, Ronald; Wright, George; and Baril, Earl F., to Trustees Boston University. Composition and method for inhibiting terminal deoxyribonucleotidyl transferase activity. 4,576,948, Cl. 514-274.000.

McCall, John M., to Upjohn Company, The. 1H-2-Benzopyran-1-yl alkyl on 1-(isochroman-1-yl)alkyl piperazines. 4,577,021, Cl. 544-376.000.

McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., to 501 Vickers PLC. Marine heave compensating device. 4,576,517, Cl. 405-195.000.

McConnell, Bernard E. Telescoping rod clamp. 4,576,501, Cl. 403-59.000.

McConnell, Richard L.: *See—*
Trotter, Jimmy R.; and McConnell, Richard L., 4,576,997, Cl. 525-444.000.

McCorkle, Charles E. Apparatus and method for separation of scar tissue in venous pathway. 4,576,162, Cl. 128-303.00R.

McCormick, James B., to Pelam, Inc. Centrifugal tissue processor. 4,576,796, Cl. 422-99.000.

McCreary, James: *See—*
Eitan, Boaz; Kolodny, Avi; Amrany, Daniel; and McCreary, James, 4,577,295, Cl. 365-218.000.

McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., to Dow Chemical Company, The. Miscible polymer blends containing poly(2-alkyl-2-oxazoline). 4,576,721, Cl. 210-640.000.

McCullough, Timothy J. Depth control gauge for meat trimming knife. 4,575,937, Cl. 30-276.000.

McCullough, Timothy J. Meat trimming knife. 4,575,938, Cl. 30-276.000.

McDermott, Charles; and Zafar, Magbool A., to Machine Products Corporation. Extension and retraction system for boom apparatus. 4,575,976, Cl. 52-118.000.

McDonald, Gerard J.: *See—*
Park, David B.; Snyder, James R.; McDonald, Gerard J.; and Hoet, Roland, 4,576,277, Cl. 198-803.010.
McGard, Inc.: *See—*
Sullivan, Jeffrey R., 4,576,308, Cl. 220-327.000.
McGarry, Richard A.: *See—*
Green, David T.; and McGarry, Richard A., 4,576,165, Cl. 128-305.000.
McKinnon, Gordon M.: *See—*
Lam, Wim J.; Devries, Luitzen; McKinnon, Gordon M.; and Baribeau, Jean J., 4,576,577, Cl. 434-58.000.
McLellan, William S.; and Marriott, Alan G., to Marriott McLellan Limited. Guitars. 4,576,080, Cl. 84-267.000.
McMillan, Duncan J.: *See—*
Jeffries, Derek K.; and McMillan, Duncan J., 4,577,135, Cl. 313-362.100.
McMinn, Robert R., to Harrison Equipment Co., Inc. Electric generator with rapid replaceable motor and method of manufacturing same. 4,575,926, Cl. 29-598.000.
McOmish, Eric R.: *See—*
McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.
McWilliam, Donald S.; and Minshall, David, to British Nuclear Fuels Limited. End closure member for a container. 4,576,779, Cl. 376-203.000.
Mead Corporation, The: *See—*
Adair, Paul C.; and Burkholder, Amy L., 4,576,891, Cl. 430-138.000.
Kannapell, Henry N.; and Nietfeld, Paul G., 4,577,235, Cl. 358-280.000.
Mead, F. Jerome. Eyeglass holder for operative association with the rear view mirror on a vehicle. 4,576,320, Cl. 224-311.000.
Meador, Jacqueline C., to United States of America, Army. Fabrication of expandable polystyrene plastic ignition containers. 4,576,094, Cl. 102-202.120.
Meadows, Winston R. Pet feeding bowl. 4,576,118, Cl. 119-62.000.
Medsys, Inc.: *See—*
Myers, George H., 4,576,176, Cl. 128-660.000.
Medtronic, Inc.: *See—*
Thompson, Howard J., 4,576,556, Cl. 417-477.000.
Meeder, Raymond L., to Siemens Gammasonics, Inc. Detector head mounting apparatus. 4,577,107, Cl. 250-363.00S.
Meeker, Thrygve R.; and Tsay, Wei-Shin, to AT&T Bell Laboratories. Small ripple surface acoustic wave filter with low insertion loss. 4,577,169, Cl. 333-194.000.
Meguro, Takeo. Nickel electroplating anode and method of forming. 4,576,701, Cl. 204-280.000.
Mehlan, Bernd: *See—*
Morgan, Annis R., Jr.; Mehlan, Bernd; Gress, Josef; and Williford, Hugh S., 4,576,272, Cl. 194-215.000.
Meier, Jacques, to FERAG AG. Method and apparatus for storing continuously arriving flat products, especially printed products, and product package formed from such products. 4,575,988, Cl. 53-399.000.
Meinke, Peter: *See—*
Stieber, Michael; Meinke, Peter; and Dreher, Gunther, 4,576,246, Cl. 180-168.000.
Melcher, Roy L.: *See—*
Ruger, William B.; and Melcher, Roy L., 4,575,963, Cl. 42-70.00F.
Melikian, Felix B.: *See—*
Latasiewicz, Leonard; Melikian, Felix B.; and Estes, Bay E., III, 4,577,259, Cl. 361-400.000.
Melin, Gerald W., to Carter-Day Company. Feed stream splitter for multiple deck screening machine. 4,576,713, Cl. 209-254.000.
Meltz, Gerald; Allen, Louis B., Jr.; and Ferrar, Carl M., to United Technologies Corporation. Temperature compensated optical pressure sensor. 4,577,100, Cl. 250-231.00P.
Meltzer, Robert J.: *See—*
Lowke, George E.; and Meltzer, Robert J., 4,576,916, Cl. 435-289.000.
Melvin, Lawrence S., Jr.: *See—*
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,576,964, Cl. 514-546.000.
Memorex Corporation: *See—*
El-Sadi, Ashraf I., 4,577,244, Cl. 360-77.000.
Menown, Hugh; and Knight, Raymond P., to English Electric Valve Company. Thyratrons. 4,577,138, Cl. 313-599.000.
Mercamp, Herbert: *See—*
Kalbfell, Heinz; Lieder, Bernhard; and Mercamp, Herbert, 4,577,043, Cl. 568-454.000.
Merck & Co., Inc.: *See—*
Greenlee, William J.; and Patchett, Arthur A., 4,576,748, Cl. 260-239.00A.
Pitzenberger, Steven M., 4,576,750, Cl. 260-239.30D.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, 4,576,903, Cl. 430-331.000.
Mercola, Gerald K.: *See—*
Chu, Paul C.; and Mercola, Gerald K., 4,577,317, Cl. 370-110.100.
Merenyi, Robert: *See—*
Viehe, Heinz; Mesmaeker, Nadine S.; and Merenyi, Robert, 4,576,759, Cl. 260-410.90R.
Merrem, Hans-Joachim: *See—*
Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, 4,576,903, Cl. 430-331.000.
Merrill, Dana A., to ITT Corporation. Multiple rate baseband transmitter. 4,577,331, Cl. 375-17.000.
Mertin, Theodor; and Hagen, Franz S., to Mannesmann Aktiengesellschaft. Hydraulically forcing contacts against electrodes for electrofurnaces. 4,577,325, Cl. 373-101.000.
Mery, Jean-Claude; Carre, Jean-Jacques; and Thioux, Alain, to Societe Anonyme D.B.A. Multi-disc brakes. 4,576,255, Cl. 188-71.500.
Merz, Jurg; and Voser, Walter, to Ciba-Geigy Corporation. Ionically modified cellulose material, its preparation and its use. 4,577,013, Cl. 536-43.000.
Mesch, Keith A.: *See—*
Bresser, Robert E.; Mesch, Keith A.; and Wursthorn, Karl R., 4,576,984, Cl. 524-182.000.
Mesmaeker, Nadine S.: *See—*
Viehe, Heinz; Mesmaeker, Nadine S.; and Merenyi, Robert, 4,576,759, Cl. 260-410.90R.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Ruger, Roderich, 4,576,432, Cl. 350-1.200.
Ruger, Roderich, 4,576,449, Cl. 350-500.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Blaschke, Hans P.; Knappik, Winfried; Mette, Horst; and Scholler, Peter, 4,577,299, Cl. 367-120.000.
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Wenger, Otto, 4,576,317, Cl. 222-600.000.
Metal Box plc: *See—*
Kelsey, Stephen F.; and Juty, Andrzej J. J., 4,576,306, Cl. 220-271.000.
Mette, Horst: *See—*
Blaschke, Hans P.; Knappik, Winfried; Mette, Horst; and Scholler, Peter, 4,577,299, Cl. 367-120.000.
Mettler, Fred A., Jr.: *See—*
Hylarides, Mark D.; and Mettler, Fred A., Jr., 4,577,046, Cl. 568-312.000.
Meunier, Paul J.: *See—*
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Meyer, Walter E.: *See—*
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Meyer, Walter J.: *See—*
Goffredo, Daniel L.; Meyer, Walter J.; and Blaising, Horst, 4,576,685, Cl. 204-30.000.
Meyn, Pieter. Machine for packaging eggs. 4,575,993, Cl. 53-534.000.
Meynier, Guy: *See—*
Carre, Jean J.; and Meynier, Guy, 4,576,257, Cl. 188-73.320.
Miale, Joseph N.: *See—*
Chang, Clarence D.; Chu, Cynthia T. W.; and Miale, Joseph N., 4,576,805, Cl. 423-277.000.
Chang, Clarence D.; and Miale, Joseph N., 4,577,048, Cl. 585-467.000.
Michaels, John M.; Croopnick, Gerald A.; and Morris, Richard A., to Dresser Industries, Inc. Membrane pack and method of making. 4,576,715, Cl. 210-347.000.
Michiguchi, Yoshihiro: *See—*
Tanisaka, Satoshi; and Michiguchi, Yoshihiro, 4,577,151, Cl. 324-158.0MG.
Micro-Circuits Company: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,576,170, Cl. 128-419.00D.
Microelectronics Center of North Carolina: *See—*
Reisman, Arnold, 4,576,884, Cl. 430-30.000.
Midock, Gary E.: *See—*
Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., 4,577,281, Cl. 364-494.000.
Midwest Energy Services Company: *See—*
Kempers, Eugene K., 4,576,197, Cl. 137-565.000.
Mihashi, Takashi: *See—*
Doi, Isao; Mihashi, Takashi; and Yokota, Shoichiro, 4,576,127, Cl. 123-90.150.
Mikhailov, Jury I.: *See—*
Makkaev, Almaxud M.; Lomovsky, Oleg I.; Mikhailov, Jury I.; and Boldyrev, Vladimir V., 4,576,689, Cl. 204-20.000.
Mikkelson, Vernon E. Instrument for use in obstructing the vas deferens. 4,576,161, Cl. 128-303.00R.
Mikuta, Richard; and Curran, Roger, to Bangor Punta Corporation. Gunsight elevating apparatus. 4,575,961, Cl. 42-1.00S.
Milberger, Walter E.; and Jones, Franklin B., to United States of America, Air Force. Miniature high performance pulsed modulator apparatus. 4,577,166, Cl. 332-9.00T.
Miles, John M., to Phillips Petroleum Company. Method for removal of residual solvent from particulate crumb made by solution polymerization. 4,575,950, Cl. 34-27.000.
Miline, Francois, to Commissariat a l'Energie Atomique. Process for confining the pollution in an area. 4,576,613, Cl. 55-1.000.
Miller, Bryan H.: *See—*
Clark, Richard E.; Tacito, Louis D.; Miller, Bryan H.; and Beck, Martin H., 4,575,915, Cl. 29-509.000.
Miller, Charles B.; and Whitt, Roy E., to Ashland Oil, Inc. Catalytic upgrading of reduced crudes and residual oils with a coke selective catalyst. 4,576,709, Cl. 208-57.000.
Miller, Craig A.; and Miller, Floyd E., to Western Precooling Systems, Inc. Produce vacuum cooler with improved venting. 4,576,014, Cl. 62-268.000.

Miller, David M.: *See*—
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,576,194, Cl. 137-84.000.

Miller, Floyd E.: *See*—
Miller, Craig A.; and Miller, Floyd E., 4,576,014, Cl. 62-268.000.

Miller, Frank A. Method and apparatus for machining a door or the like. 4,576,213, Cl. 144-371.000.

Miller-Jones, Stockton M., to General Electric Company. Wide aperture ultrasonic scanner employing convex transducer array. 4,576,045, Cl. 73-626.000.

Miller, Norman W.: *See*—
Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., 4,576,518, Cl. 405-205.000.

Miller, Paul H. Exercising apparatus. 4,576,376, Cl. 272-69.000.

Miller, Peter: *See*—
Millsap, James W.; and Miller, Peter, 4,577,182, Cl. 340-539.000.

Milliken Research Corporation: *See*—
Machell, Greville, 4,576,665, Cl. 156-72.000.
Pascoe, William M., Sr., 4,576,611, Cl. 8-482.000.

Mills, Edwin R., to Fieldcrest Mills, Inc. Electrical heating apparatus protected against an overheating condition. 4,577,094, Cl. 219-505.000.

Millsap, James W.; and Miller, Peter, to Miller, Peter. Alarm system. 4,577,182, Cl. 340-539.000.

Milnes, Arthur G. Optical card and card reader system for purchase of parking time. 4,576,273, Cl. 194-209.000.

Mims, Donald S.: *See*—
Huang, Wann-Sheng; Mims, Donald S.; and Allen, Richard S., 4,576,036, Cl. 73-29.000.

Miner Enterprises, Inc.: *See*—
Carlstedt, Richard A., 4,576,295, Cl. 213-32.00R.

Minjolle, Louis: *See*—
Broussaud, Daniel; Mustel, William; and Minjolle, Louis, 4,576,923, Cl. 501-98.000.

Minnesota Mining and Manufacturing Company: *See*—
Larson, Curtis L., 4,576,297, Cl. 215-250.000.
Martens, John A., 4,576,850, Cl. 428-156.000.
Reilly, Laurence W., Jr., 4,576,975, Cl. 522-13.000.
Vallarino, Angelo, 4,576,908, Cl. 430-512.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ito, Masazumi; and Murata, Tomoji, 4,576,472, Cl. 355-50.000.
Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse, Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, 4,576,470, Cl. 355-38.000.

Minshall, David: *See*—
McWilliam, Donald S.; and Minshall, David, 4,576,779, Cl. 376-203.000.

Mischke, Peter; and Fuchs, Hermann, to Hoechst Aktiengesellschaft. Water-soluble fibre-reactive phthalocyanine compounds. 4,576,755, Cl. 260-245.780.

Mishima, Mannen: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.

Mishio, Hiroshi, to Alps Electric Co., Ltd. Printing head. 4,576,491, Cl. 400-124.000.

Misu, Hiroshi: *See*—
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, 4,576,893, Cl. 430-457.000.

Mita Industrial Co., Ltd.: *See*—
Fushida, Akira; Hasegawa, Yuuji; and Matsui, Toshikazu, 4,576,465, Cl. 355-3.0DD.
Miyakawa, Nobuhiro; Maekawa, Kouji; Higashiguchi, Teruaki; and Nakatani, Kaname, 4,576,888, Cl. 430-106.000.
Sakata, Hiromi; Kozuka, Nobuhiko; and Hiraoka, Hiroshi, 4,576,464, Cl. 355-3.00R.

Mitake, Hitoshi: *See*—
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.

Mitchell, Wayne J.: *See*—
Proud, Todd A.; Lin, Tom F.; Mitchell, Wayne J.; and Kasper, James D., 4,576,185, Cl. 128-760.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Kuriyama, Shizuo; and Saitoh, Mikio, 4,576,966, Cl. 514-648.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Jidai, Eiki; and Hashizume, Aiichiro, 4,576,694, Cl. 204-181.100.
Kimata, Masafumi, 4,577,233, Cl. 358-213.000.
Marubashi, Akira, 4,577,177, Cl. 340-19.00R.
Ogushi, Tetsurou; and Murakami, Masaaki, 4,576,009, Cl. 62-3.000.
Tanahashi, Tooru; and Tadenuma, Isao, 4,576,253, Cl. 187-29.00R.
Yoshida, Fumio; and Kotera, Yoshikazu, 4,576,027, Cl. 72-11.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Miyamoto, Shigehiko, 4,576,867, Cl. 428-342.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Yamaoka, Keijiro, 4,576,006, Cl. 60-641.500.

Mittex Aktiengesellschaft: *See*—
Hussmann, Peter, 4,576,820, Cl. 424-195.100.

Mitutoyo Mfg. Co., Ltd.: *See*—
Matsumiya, Sadayuki, 4,577,142, Cl. 318-592.000.

Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, to Toyota Jidosha Kabushiki Kaisha. Magnetic fluid incorporating fine magnetic powder and method for making the same. 4,576,725, Cl. 252-62.510.

Miura, Nobuhiro: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,576,863, Cl. 428-325.000.

Miura, Yuzo; and Yamada, Akira, to Canon Kabushiki Kaisha. Eye-cup for camera. 4,576,459, Cl. 354-287.000.

Miyajima, Mikio: *See*—
Hibino, Ikuo; and Miyajima, Mikio, 4,577,198, Cl. 346-76.0PH.

Miyakawa, Kazuo, to Yoshida Kogyo K. K. Method and apparatus for attaching fly strips to a slide fastener chain. 4,576,104, Cl. 112-265.200.

Miyakawa, Nobuhiro; Maekawa, Kouji; Higashiguchi, Teruaki; and Nakatani, Kaname, to Mita Industrial Company, Limited. Toner for electrophotography comprising azoic pigment having silica core. 4,576,888, Cl. 430-106.000.

Miyake, Hidenori; Fujiwara, Shunji; Nakazato, Yoshio; Yanagishima, Fumiya; and Teshiba, Toko, to Kawasaki Steel Corporation. Method of coiling thin strips. 4,576,029, Cl. 72-205.000.

Miyamoto, Shigehiko, to Mitsubishi Paper Mills, Ltd. Ink jet recording paper. 4,576,867, Cl. 428-342.000.

Miyanagi, Naoki: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.

Miyata, Shigeo; and Nosu, Tsutomu, to Kyowa Chemical Industry Co., Ltd. Aluminum hydroxide gel, process for production thereof, and use thereof. 4,576,819, Cl. 424-156.000.

Miyazaki, Hiroshi; and Ikeda, Masato, to Shionogi & Company, Ltd. Micro electrode. 4,576,174, Cl. 128-639.000.

Miyazaki, Nobuyuki; Takayanagi, Takashi; and Higaki, Hiromichi, to Asahi Glass Company Ltd. Curable resin composition. 4,576,977, Cl. 523-137.000.

Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,576,911, Cl. 430-548.000.

Mobay Chemical Corporation: *See*—
Oliver, Vincent S.; Tames, Walter; Prochaska, Helmuth H.; and Wieser, Karl-Heinz, 4,576,649, Cl. 106-308.00Q.
Rieck, James N., 4,576,731, Cl. 252-182.000.

Mobil Oil Corporation: *See*—
Chang, Clarence D.; Chu, Cynthia T. W.; and Miale, Joseph N., 4,576,805, Cl. 423-277.000.
Chang, Clarence D.; and Miale, Joseph N., 4,577,048, Cl. 585-467.000.
Chen, Catherine S. H.; and Williams, Albert L., 4,577,000, Cl. 525-534.000.
Hinkley, David, 4,577,298, Cl. 367-50.000.
Kaeding, Warren W.; and Lee, Carol S., 4,577,050, Cl. 585-486.000.
Kalkomey, Cynthia T.; Mason, Thomas J.; and Pann, Keh, 4,577,297, Cl. 367-24.000.
Rudnick, Leslie R., 4,577,049, Cl. 585-486.000.

Mochizuki, Akira: *See*—
Takahashi, Koji; and Mochizuki, Akira, 4,576,371, Cl. 271-296.000.

Mock, Gerald L.: *See*—
Hanscom, Bradford E.; and Mock, Gerald L., 4,577,063, Cl. 179-6.160.

Modern Globe, Inc.: *See*—
O'Brien, Richard W.; and Rogers, Gwyn D., 4,575,909, Cl. 26-18.600.

Moeller, Charles E.: *See*—
Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., 4,577,103, Cl. 250-316.100.

Mogul Corporation, The: *See*—
Gaylor, Lawrence A.; and Beard, James W., 4,576,722, Cl. 210-699.000.

Mohan, William L.; and Willits, Samuel P., to Spartanics Ltd. Method and apparatus for operating a magnetic clutch. 4,576,262, Cl. 192-18.00B.

Mohasco Corporation: *See*—
Powell, Larry D.; and Tidwell, Charles J., Jr., 4,575,883, Cl. 5-13.000.

Molnar, Gabor: *See*—
Kassza, Tibor; Kakonyi, Gyula; and Molnar, Gabor, 4,576,025, Cl. 70-276.000.

Molnar, John; and Porter, Robert B., Jr., to Caterpiller Tractor Co. Seat belt apparatus. 4,576,414, Cl. 297-476.000.

Mommer, Heinrich, to M. Faensen; and Iphas Pharma-Verpackung. Dosing device for infusion or transfusion of fluids. 4,576,593, Cl. 604-250.000.

Monsanto Company: *See*—
McAlister, Donald R.; and Ziebold, Steven A., 4,576,813, Cl. 423-522.000.

Monsigny, Michel, to Centre National de la Recherche Scientifique. Method for the fluorimetric determination of endotoxins, new peptides carrying a fluorophorous substance usable in said method and method for its preparation. 4,576,745, Cl. 260-112.50R.

Montedison S.p.A.: *See*—
Bottazzini, Nicola; and Quaglino, Marino, 4,577,010, Cl. 528-487.000.

Monterey Manufacturing Co.: *See*—
Hall, Charles P., 4,575,885, Cl. 5-450.000.

Montgomery, John R.; Brumaghim, Milton W.; and Deniega, Jose C., to American Cyanamid Company. Surgical ligating instrument. 4,576,166, Cl. 128-325.000.

Montgomery, Robert E.; and Pellico, Michael A., to Laclede Professional Products, Inc. Enzymatic bandages and pads. 4,576,817, Cl. 424-94.000.
Montierth, Max R.: *See*—
Hazard, Gary M.; Hillman, Arthur E.; Montierth, Max R.; and Nieber, Albert R., 4,576,774, Cl. 264-267.000.
Montret, Jean-Francois: *See*—
Conche, Francois; and Montret, Jean-Francois, 4,577,112, Cl. 250-506.100.
Moore, Benjamin N.: *See*—
Hall, Henry B.; Hewes, Peter B.; Moore, Benjamin N.; and Sanzaro, Rosario, 4,576,798, Cl. 422-105.000.
Morgan, Annis R., Jr.; Mehlan, Bernd; Gress, Josef; and Williford, Hugh S., to Coca-Cola Company, The. Counter-top or wall-mounted vending machine. 4,576,272, Cl. 194-215.000.
Mori, Takashi: *See*—
Sasaki, Ichitaro; Mori, Takashi; and Tsuyuguchi, Tadao, 4,576,344, Cl. 242-67.10R.
Moriguchi, Hiroyuki: *See*—
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, to Nippon Telegraph & Telephone Public Corp.; and Hitachi Construction Machinery Co., Ltd. Pipe laying apparatus. 4,576,515, Cl. 405-184.000.
Morinaga, Akio; Sakaguchi, Yoichi; Hyodo, Masakatsu; and Yagi, Isaburo, to Tokyo Gas Co., Ltd.; and Ashimori Industry Co., Ltd. Tubular lining material for pipe lines having bends. 4,576,205, Cl. 138-98.000.
Morita Iron Works Co., Ltd.: *See*—
Morita, Motoo, 4,576,028, Cl. 72-143.000.
Morita, Motoo, to Morita Iron Works Co., Ltd. Method of making a coil spring and apparatus therefor. 4,576,028, Cl. 72-143.000.
Moritani, Takeshi: *See*—
Tanaka, Yoshinari; Aoyama, Akimasa; Moritani, Takeshi; Satoh, Kenji; and Okaya, Takuji, 4,576,988, Cl. 524-503.000.
Moriya, Koji: *See*—
Tsurushima, Masaaki; Kokubu, Gozi; and Moriya, Koji, 4,577,012, Cl. 536-24.000.
Moriyama, Shigeo, to Hitachi, Ltd. Ultra-precision two-dimensional moving apparatus. 4,575,942, Cl. 33-1.00M.
Morland, Robert B.; Cooke, Anson R.; and Bishop, John R., to Union Carbide Corporation. Herbicidal thiadiazole ureas. 4,576,629, Cl. 71-90.000.
Morohoshi, Yasuo: *See*—
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.
Morris, Joel, to Upjohn Company, The. Anti-inflammatory lipoxin B analogs. 4,576,758, Cl. 260-405.500.
Morris, Richard A.: *See*—
Michaels, John M.; Croopnick, Gerald A.; and Morris, Richard A., 4,576,715, Cl. 210-347.000.
Morrison, Bruce J.: *See*—
Parry, Lawrence J.; and Morrison, Bruce J., 4,576,801, Cl. 427-288.000.
Morton Thiokol, Inc.: *See*—
Bresser, Robert E.; Mesch, Keith A.; and Wursthorn, Karl R., 4,576,984, Cl. 524-182.000.
Morvan, Jean: *See*—
Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, 4,576,717, Cl. 210-610.000.
Moser, Manfred: *See*—
Funger, Bernhard; Gruber, Heinz; Hartmann, Werner; Kohnen, Julius; Kutz, Johannes; and Moser, Manfred, 4,576,112, Cl. 118-415.000.
Moss, Gerald. Feeding device for enterally administering liquids into a human body. 4,576,603, Cl. 604-410.000.
Moss, Steven Y.: *See*—
Cowlam, Stephen K.; Moss, Steven Y.; Stockwell, Claude L.; and Phillips, Victor R., 4,576,765, Cl. 210-801.000.
Motorola, Inc.: *See*—
Bynum, Byron G.; and Cave, David L., 4,577,211, Cl. 357-34.000.
Latasiewicz, Leonard; Melikian, Felix B.; and Estes, Bay E., III, 4,577,259, Cl. 361-400.000.
Markham, David C., 4,577,290, Cl. 365-12.000.
Peterson, Joe W., 4,577,162, Cl. 330-253.000.
Mott, James D.; and Wolff, Danny K., to Hydril Company. Remotely operable safety valve. 4,576,358, Cl. 251-14.000.
Mottram, William R.; Fisher, Gene A.; and Feierabend, Louis, to Proto-Med. Inc. Method and apparatus for concentrating oxygen. 4,576,616, Cl. 55-68.000.
Moufflet, Luc; Roux, Michel; and Valadier, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of polishing the surface of glass articles. 4,576,571, Cl. 432-9.000.
Moulton, Alexander E.; and Uncles, Philip B., to Alex Moulton Limited. Bicycle suspension. 4,576,393, Cl. 280-276.000.
MSK-Verpackungs-Systeme GmbH: *See*—
Hannen, Rainer W., 4,575,989, Cl. 53-434.000.
Mueller, Edward E.; and Jensen, Paul L., to Whirl-Air-Flow Corporation. Apparatus and method for cleaning contaminated soil. 4,576,572, Cl. 432-13.000.
Mueller, Kurt H., to GRETAG Aktiengesellschaft. Decoding process and apparatus. 4,577,059, Cl. 178-22.170.
Muhlhaus, Ludwig: *See*—
Koch, Manfred; Muhlhaus, Ludwig; Lambach, Rolf; and Grochowski, Horst, 4,576,924, Cl. 502-56.000.
Mukaida, Yoshito: *See*—
Okita, Tsutomu; Tsuji, Nobuo; and Mukaida, Yoshito, 4,576,866, Cl. 428-336.000.
Mukoh, Akio: *See*—
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
Muller, Egbert; and Stumpe, Werner, to Robert Bosch GmbH. Multicircuit pressure medium brake system. 4,576,416, Cl. 303-15.000.
Muller, Maurice E.; and Frey, Otto, to Sulzer Brothers Limited. Injector for bone cement. 4,576,152, Cl. 128-92.00R.
Muller, Niklaus; and Audemars, Daniel, to Castolin S.A. Arrangement for supplying powdered material to a spraying device. 4,576,526, Cl. 406-75.000.
Mullersman, Ferdinand H., to General Electric Company. Charging system having electromagnetic field means for distinguishing between primary and secondary batteries. 4,577,145, Cl. 320-2.000.
Mullersman, Ferdinand H.: *See*—
Hodgman, John S.; and Mullersman, Ferdinand H., 4,577,144, Cl. 320-2.000.
Multinorm B.V.: *See*—
Van Paradijs, Hendrikus J. A.; and Mynders, Gysbert J., 4,575,997, Cl. 56-16.400.
Mundell, Richard H., to Shell Oil Company. Peristaltic down-hole drilling motor. 4,576,242, Cl. 175-107.000.
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., to BS&B Safety Systems, Inc. Rupturable pressure relieving fluid containers. 4,576,303, Cl. 220-89.00A.
Munzer, Manfred: *See*—
Liebler, Ralf; Besecke, Siegmund; and Munzer, Manfred, 4,576,870, Cl. 428-515.000.
Murabayashi, Akira: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, 4,576,956, Cl. 514-380.000.
Murakami, Kiyotaka; and Kimura, Yoshiaki, to Koniahiroku Photo Industry Co. Ltd. Fluid droplet ejecting system. 4,577,201, Cl. 346-140.00R.
Murakami, Manabu: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Murakami, Masaaki: *See*—
Ogushi, Tetsurou; and Murakami, Masaaki, 4,576,009, Cl. 62-3.000.
Muramatsu, Katsuhiko: *See*—
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.
Muramatsu, Masaru: *See*—
Sugano, Akira; Muramatsu, Masaru; Yamanobe, Sachio; and Sato, Yoshio, 4,577,270, Cl. 364-151.000.
Murata, Hitoshi: *See*—
Kitamura, Kengo; and Murata, Hitoshi, 4,575,934, Cl. 29-787.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,576,341, Cl. 242-35.50A.
Murata Manufacturing Co., Ltd.: *See*—
Tabuchi, Makoto; and Imanishi, Kiyoshi, 4,575,995, Cl. 53-591.000.
Murata, Shouichi; Makiyama, Muneto; Omoto, Takahiro; and Yasumoto, Taizo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pile fabric having shrunken pile and non-shrinkable pile. 4,576,840, Cl. 428-16.000.
Murata, Tomoji: *See*—
Ito, Masazumi; and Murata, Tomoji, 4,576,472, Cl. 355-50.000.
Murata, Toshinori: *See*—
Arai, Ikuya; Murata, Toshinori; and Kazumi, Masafumi, 4,577,228, Cl. 358-167.000.
Muren, Sture, to Santrade Ltd. Thread cutting insert. 4,575,888, Cl. 10-101.00R.
Murray, Charles R.; and Harrison, Ray E., to C-I-L Inc. Shipping bag. 4,576,844, Cl. 428-35.000.
Murray, W. Kirby; and Sullivan, David O., to Tri-State Oil Tool Industries, Inc. Locking pipe sub. 4,576,402, Cl. 285-39.000.
Mustel, William: *See*—
Broussaud, Daniel; Mustel, William; and Minjolle, Louis, 4,576,923, Cl. 501-98.000.
Muto, Yukio; Kinugawa, Masumi; and Abe, Tomoaki, to Nippondenso Co., Ltd. Air-flow detecting apparatus. 4,576,039, Cl. 73-118.000.
Muzzarelli, Gabriele. Apparatus for cheese compacting. 4,576,091, Cl. 99-455.000.
Myers, George H., to Medsys, Inc. Transducer for measurement of corneal thickness. 4,576,176, Cl. 128-660.000.
Mynders, Gysbert J.: *See*—
Van Paradijs, Hendrikus J. A.; and Mynders, Gysbert J., 4,575,997, Cl. 56-16.400.
Nagahara, Shuusaku: *See*—
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; and Takemoto, Iwao, 4,577,230, Cl. 358-212.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Front chain gear for a bicycle. 4,576,587, Cl. 474-152.000.
Naito, Michinori, to Trio Kabushiki Kaisha. Distortion cancel circuit in FM stereo. 4,577,342, Cl. 381-13.000.
Naitoh, Katsumi; and Shimamura, Tadaaki, to NSK Warner K.K. Method for preparing a seat belt buckle mechanism. 4,575,916, Cl. 29-517.000.
Nakabayashi, Masamitsu; Furukawa, Yuzo; and Tashiro, Akira, to Takeda Chemical Industries, Inc. Laminated article and production thereof. 4,576,995, Cl. 525-285.000.
Nakaguti, Osamu: *See*—
Kamiya, Takashi; Hashimoto, Masashi; and Nakaguti, Osamu, 4,576,753, Cl. 260-239.00A.
Nakai, Masaaki: *See*—
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, to Nissan Motor Company, Limited. Engine starting air fuel ratio control system. 4,576,132, Cl. 123-438.000.
Nakajima, Yukio: *See*—
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,576,650, Cl. 134-22.120.
Nakakita, Eiji; Koike, Akinobu; Sekiya, Toshiyuki; Misu, Hiroshi; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Presensitized lithographic printing plate precursor. 4,576,893, Cl. 430-457.000.
Nakamura, Kenji: *See*—
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.
Nakamura, Mitsuo: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.
Nakamura, Takeaki: *See*—
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,576,650, Cl. 134-22.120.
Nakanishi, Kazuo: *See*—
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,576,341, Cl. 242-35.50A.
Nakanishi, Toshiharu: *See*—
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,577,132, Cl. 310-800.000.
Nakao, Shinroku; and Tsuchiya, Kunimasa, to Combi Co., Ltd. Caster with an oscillation stopping mechanism. 4,575,896, Cl. 16-35.00R.
Nakatani, Kaname: *See*—
Miyakawa, Nobuhiro; Maekawa, Kouji; Higashiguchi, Teruaki; and Nakatani, Kaname, 4,576,888, Cl. 430-106.000.
Nakayama, Syoichi: *See*—
Suzuki, Setsuo; Tsuge, Morio; and Nakayama, Syoichi, 4,576,896, Cl. 430-271.000.
Nakazato, Yoshio: *See*—
Miyake, Hidenori; Fujiwara, Shunji; Nakazato, Yoshio; Yanagishima, Fumiya; and Teshiba, Toko, 4,576,029, Cl. 72-205.000.
Nakazawa, Masao; Yashima, Michio; and Takahashi, Shuuji, to Honda Giken Kogyo Kabushiki Kaisha. Sealed lead acid battery. 4,576,879, Cl. 429-86.000.
Nalbantian, Charles A.: *See*—
Kreisher, John H.; and Nalbantian, Charles A., 4,576,693, Cl. 204-180.100.
Nambu, Shigeo, to Kabushiki Kaisha Toshiba. Data transmission including a repeater. 4,577,327, Cl. 375-4.000.
Namiki, Yasuomi: *See*—
Hirohashi, Kazutoshi; Ishigaki, Yukinobu; and Namiki, Yasuomi, 4,577,161, Cl. 330-149.000.
Naoe, Masahiko: *See*—
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, 4,576,700, Cl. 204-192.00M.
Narendra, Pat M.: *See*—
Fitch, Robert C.; and Narendra, Pat M., 4,577,223, Cl. 358-113.000.
Naruse, Kazuhiko: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse, Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, 4,576,470, Cl. 355-38.000.
Nash, Peter D., to AT&T Bell Laboratories. Arrangement for wideband transmission via a switched network. 4,577,312, Cl. 370-84.000.
Naslain, Roger: *See*—
Colmet, Robert; Naslain, Roger; Hagenmuller, Paul; and Lamico, Pierre, 4,576,836, Cl. 427-255.000.
Nassauer, Konrad, to Borsig GmbH. Heat exchanger for cooling hot gases, especially those deriving from the synthesis of ammonia. 4,576,225, Cl. 165-101.000.
National Semiconductor Corporation: *See*—
Wong, Hee; and Chen, Carson, 4,577,335, Cl. 375-86.000.
National Starch and Chemical Corporation: *See*—
Iovine, Carmine P.; Palmer, Joseph G.; and Walker, James L., 4,577,031, Cl. 548-319.000.
Natsume, Toshio: *See*—
Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, 4,576,725, Cl. 252-62.510.
Nauchno-Issledovatelsky Institut Khirurgii Imeni A.V. Vishnevskogo: *See*—
Kaidash, Arnold N.; Iofis, Naum A.; Khurtsilava, Semen G.; Bukatov, Alexandr S.; and Danilova, Zinaida P., 4,576,605, Cl. 623-2.000.
Naumann, Leo J.: *See*—
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., 4,576,303, Cl. 220-89.00A.
Nay, Barry; and Stewart, David G., to British Petroleum Company P.L.C., The. Catalyst composition and its use in a process for the production of alcohols from synthesis gas. 4,576,968, Cl. 518-713.000.
NCR Corporation: *See*—
Boer, Jan; and Diepstraten, Wilhelmus J. M., 4,577,334, Cl. 375-97.000.
Sobczak, Zbigniew P., 4,576,834, Cl. 427-93.000.
NEC Corporation: *See*—
Kiuchi, Eiichi; Sawanaka, Hiroshi; and Tomita, Yuichi, 4,577,193, Cl. 343-380.000.
Otsuka, Shigeru, 4,577,315, Cl. 370-95.000.
Senoo, Keiichi, 4,577,328, Cl. 375-13.000.
Needham, James C.; Rivett, Robert M.; and Perryman, Raymond A. G., to Welding Institute, The. Monitoring in-service resistance of AC conductors. 4,577,086, Cl. 219-117.100.
Neff, Andreas, to Bracker AG. Apparatus for placing or mounting ring travelers on spinning or twisting rings. 4,575,933, Cl. 29-765.000.
Neff Gewindespindeln GmbH: *See*—
Lehmann, Wolfgang; and Aab, Hans-Walter, 4,576,420, Cl. 308-6.00C.
Nehl, Rainer: *See*—
Klie, Jurgen; and Nehl, Rainer, 4,577,219, Cl. 358-78.000.
Neimann S.A.: *See*—
Weber, Gunter, 4,576,024, Cl. 70-252.000.
Neiss, Edward S.: *See*—
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,576,941, Cl. 514-222.000.
Neldeberg, Poul; and Olsen, Steen H., to Danfoss A/S. Heating installation with heat pump. 4,576,332, Cl. 237-2.00B.
Nelson, James A.: *See*—
Kruger, Robert A.; and Nelson, James A., 4,577,222, Cl. 358-111.000.
Nelson, John A.: *See*—
Stout, Gregg W.; Nelson, John A.; and Crisp, John H., 4,576,236, Cl. 166-386.000.
Nelson, John E., to Eberhard Faber, Inc. Artist's work and storage station. 4,576,424, Cl. 312-231.000.
Nelson, Kenneth L., to King Seeley Thermos Co. Ice making apparatus. 4,576,016, Cl. 62-320.000.
Nelson, Raymond F.: *See*—
Dove, Doublas J. A.; and Nelson, Raymond F., 4,576,280, Cl. 206-289.000.
Nemiroff, Michael H., to Burroughs Corporation. Method of fabricating integrated circuits incorporating steps to detect presence of gettering sites. 4,575,922, Cl. 29-574.000.
Nemoto, Shigeru; Kitajima, Goro; Saitou, Sinichi; and Osada, Hazime, to Olympus Optical Co., Ltd. Operating lever device of magnetic recording tape transport apparatus. 4,577,245, Cl. 360-93.000.
Nerizon, Nelly A.: *See*—
Ravel, Kanak K. R.; Vaidya, Bhupendra R.; and Nerizon, Nelly A., 4,576,645, Cl. 106-125.000.
Nestec S. A.: *See*—
Liu, Richard T.; Nickerson, Winston R.; and Anderson, Charles H., 4,576,826, Cl. 426-289.000.
Netzer, David; and Huebel, Robert R., to Randall Corporation, The. Carbon dioxide hydrocarbons separation process. 4,576,615, Cl. 55-43.000.
Neugebauer, Steffen: *See*—
Scharting, Gunter; and Neugebauer, Steffen, 4,576,382, Cl. 277-12.000.
Neuschuetz, Dieter: *See*—
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.
Neuwirth, Manfred: *See*—
Eisenlauer, Josef; Horn, Dieter; and Neuwirth, Manfred, 4,576,723, Cl. 210-709.000.
New York Institute of Technology: *See*—
Glenn, William E., 4,576,048, Cl. 73-642.000.
Newellpharma s.r.l.: *See*—
Perna, Giorgino, 4,576,216, Cl. 164-21.000.
Newman, Leon A.; and Kennedy, John T., to United Technologies Corporation. U Channel waveguide laser. 4,577,323, Cl. 372-64.000.
Nguyen, Tanh V., to Chevron Research Company. Methods for metering two-phase flow. 4,576,043, Cl. 73-195.000.
Nhy-Temp, Inc.: *See*—
Windecker, Robert J., 4,576,010, Cl. 62-64.000.
NI Industries, Inc.: *See*—
Hempelmann, Heinrich J., 4,576,415, Cl. 301-37.00S.
Nichols, Ernest, Jr.: *See*—
Brasell, James M.; and Nichols, Ernest, Jr., 4,576,542, Cl. 414-626.000.
Nickerson, Winston R.: *See*—
Liu, Richard T.; Nickerson, Winston R.; and Anderson, Charles H., 4,576,826, Cl. 426-289.000.
Nieber, Albert R.: *See*—
Hazard, Gary M.; Hillman, Arthur E.; Montierth, Max R.; and Nieber, Albert R., 4,576,774, Cl. 264-267.000.
Nielsen, Karl I. Device for laying out a pipeline. 4,576,514, Cl. 405-154.000.
Nietfeld, Paul G.: *See*—
Kannapell, Henry N.; and Nietfeld, Paul G., 4,577,235, Cl. 358-280.000.

Nifco Inc.: *See*—
Omata, Nobuaki, 4,576,252, Cl. 185-39.000.
Nippon Electric Co. Ltd.: *See*—
Oura, Toshio, 4,577,343, Cl. 381-51.000.
Nippon Kogaku K. K.: *See*—
Daitoku, Koichi; and Tsukahara, Daiki, 4,576,460, Cl. 354-400.000.
Inadome, Kiyotaka, 4,576,445, Cl. 350-427.000.
Nippon Kogaku K.K.: *See*—
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, 4,577,141, Cl. 318-590.000.
Nippon Optical Fiber Co., Ltd.: *See*—
Kurahashi, Yoshio, 4,576,854, Cl. 428-204.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Kawatani, Kimio; Fujikawa, Takashi; and Watanabe, Eiji, 4,576,680, Cl. 162-158.000.
Nippon Steel Corporation: *See*—
Suzuki, Ryoichi; Ohno, Jiro; and Gondo, Hisashi, 4,576,639, Cl. 75-123.00E.
Nippon Telegraph & Telephone Public Corp.: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.
Nippondenso Co., Ltd.: *See*—
Muto, Yukio; Kinugawa, Masumi; and Abe, Tomoaki, 4,576,039, Cl. 73-118.000.
Nishida, Minoru: *See*—
Satoh, Susumu; Obara, Takashi; and Nishida, Minoru, 4,576,656, Cl. 148-12.00C.
Nishida, Naoto; Takahashi, Tadashi; and Kakizaki, Katsuyuki, to Kabushiki Kaisha Toshiba. High power output laser apparatus. 4,577,324, Cl. 372-95.000.
Nishikawa, Kohei: *See*—
Tsushima, Susumu; and Nishikawa, Kohei, 4,576,933, Cl. 514-77.000.
Nishimura, Akira: *See*—
Tsuno, Koichi; and Nishimura, Akira, 4,576,145, Cl. 128-6.000.
Nishimura, Keizo: *See*—
Takeuchi, Takashi; Nishimura, Keizo; Kobayashi, Masaharu; and Oiso, Kazumasa, 4,577,319, Cl. 371-38.000.
Nishimura, Mizuho: *See*—
Kogane, Mikio; and Nishimura, Mizuho, 4,576,471, Cl. 355-50.000.
Kogane, Mikio; Nishimura, Mizuho; and Yamamoto, Takashi, 4,576,473, Cl. 355-68.000.
Shiraishi, Atsushi; and Nishimura, Mizuho, 4,576,474, Cl. 355-75.000.
Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Endoscope including a reflector related by an inequality for uniform light distribution. 4,576,435, Cl. 350-96.260.
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, to Konishiroku Photo Industry Co., Ltd. Vapor source holding container. 4,576,797, Cl. 422-102.000.
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, to Aisin Seiki Kabushiki Kaisha. Shift lever support mechanism for transmissions. 4,576,059, Cl. 74-473.00P.
Nissan Chemical Industries, Ltd.: *See*—
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yashio; and Iizumi, Toyoko, 4,577,025, Cl. 546-198.000.
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,576,934, Cl. 514-85.000.
Nissan Motor Co., Ltd.: *See*—
Doi, Isao; Mihashi, Takashi; and Yokota, Shoichiro, 4,576,127, Cl. 123-90.150.
Kitamura, Kengo; and Murata, Hitoshi, 4,575,934, Cl. 29-787.000.
Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,576,265, Cl. 192-0.055.
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, 4,576,132, Cl. 123-438.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Mazaki, Shiro; and Shibata, Hiroshi, 4,576,990, Cl. 524-602.000.
Niveau AG: *See*—
Preusker, Werner, 4,576,214, Cl. 152-213.00A.
Noda, Yasumasa; and Suzuki, Yoichi, to Kabushiki Kaisha Toshiba. Apparatus for preheating mold resin for a semiconductor device. 4,577,078, Cl. 219-10.55A.
Noel, Gert. Flexible plastic foam with a groove- and tongue-like closing system. 4,576,846, Cl. 428-36.000.
Nogi, Toshiharu: *See*—
Yamauchi, Teruo; Nogi, Toshiharu; and Oyama, Yoshishige, 4,576,136, Cl. 123-590.000.
Noiles, Douglas G., to United States Surgical Corporation. Surgical stapler apparatus with curved shaft. 4,576,167, Cl. 128-334.00R.
Noll, Klaus; Potter, Terry; Pedain, Josef; and Schwindt, Jurgen, to Bayer Aktiengesellschaft. Aqueous solutions or dispersions of cationic oligo-urethanes, a process for the production thereof and the use thereof to produce coatings. 4,576,989, Cl. 524-591.000.
Nomori, Hiroyuki: *See*—
Nishiwaki, Akira; Morohoshi, Yasuo; Mitake, Hitoshi; Moriguchi, Hiroyuki; Nomori, Hiroyuki; and Ito, Kunio, 4,576,797, Cl. 422-102.000.
Nomoto, Shosaku: *See*—
Kobayashi, Hiroyasu; Fukui, Masayuki; and Nomoto, Shosaku, 4,576,672, Cl. 156-177.000.
Nongbri, Govanon; and Chervenak, Michael C., to HRI, Inc. Catalyst desulfurization of petroleum residua feedstocks. 4,576,710, Cl. 208-58.000.
Noranda Inc.: *See*—
Smyth, Laurence C.; and Deep, George, 4,576,220, Cl. 164-66.100.
Norden, Jurgen; Aigner, Heinrich; Schindler, Fritz; and Samblebe, Reinhard, to Huls Aktiengesellschaft. Fertilizers containing urea with urease inhibitors. 4,576,625, Cl. 71-3.000.
NORDICA S.p.A.: *See*—
Borsoi, Bruno, 4,575,955, Cl. 36-117.000.
Nordlund, Viljo T. J., to Valio Meijerien Keskusosuusliiki. Process for the production of fermented milk products. 4,576,822, Cl. 426-43.000.
Nordson Corporation: *See*—
Hastings, Donald R.; and Sharpless, John, 4,576,827, Cl. 427-27.000.
Hollingsworth, Alexander, 4,575,991, Cl. 53-509.000.
Normann, Richard A., to University of Utah. Method and apparatus for measuring liquid flow. 4,576,182, Cl. 128-692.000.
North American Manufacturing Company: *See*—
Shannon, Robert A., 4,577,278, Cl. 364-477.000.
North American Philips Corporation: *See*—
Arnold, Emil, 4,575,923, Cl. 29-576.00B.
Northern Engineering Industries, plc: *See*—
Gould, Deryk S. M.; and Wright, Michael T., 4,577,128, Cl. 310-87.000.
Nosu, Tsutomu: *See*—
Miyata, Shigeo; and Nosu, Tsutomu, 4,576,819, Cl. 424-156.000.
NSK Warner K.K.: *See*—
Naitoh, Katsumi; and Shimamura, Tadaaki, 4,575,916, Cl. 29-517.000.
Nucor Corporation: *See*—
Lott, Hamilton, Jr.; and Strock, Lynn E., 4,575,983, Cl. 52-544.000.
Nutter, Dale E. Packings for gas-liquid contact apparatus. 4,576,763, Cl. 261-94.000.
O. J. Ouellette Inc.: *See*—
Chartier, George R., 4,576,533, Cl. 411-373.000.
O & S Manufacturing Company: *See*—
Smith, Joseph E., 4,576,499, Cl. 403-27.000.
Obara Corporation: *See*—
Obara, Hiroshi, 4,577,090, Cl. 219-137.900.
Obara, Hiroshi, to Obara Corporation. Primary cable apparatus for robot welding gun. 4,577,090, Cl. 219-137.900.
Obara, Takashi: *See*—
Satoh, Susumu; Obara, Takashi; and Nishida, Minoru, 4,576,656, Cl. 148-12.00C.
O'Brien, Matthew T.: *See*—
O'Brien, William J.; and O'Brien, Matthew T., 4,576,922, Cl. 501-32.000.
O'Brien, Richard W.; and Rogers, Gwyn D., to Modern Globe, Inc. Apparatus for treating fabric for shrinkage. 4,575,909, Cl. 26-18.600.
O'Brien, William J.; and O'Brien, Matthew T., to University of Michigan, The Regents of the. High expansion dental crown core ceramic composition. 4,576,922, Cl. 501-32.000.
Occidental Chemical Corporation: *See*—
Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,577,044, Cl. 568-677.000.
Ocean Ecology Ltd.: *See*—
Koblanski, John N., 4,576,569, Cl. 431-1.000.
O'Connell, Joseph C.: *See*—
Levy, Stephen; O'Connell, Joseph C.; Wright, William H., Jr.; and Weiner, Maurice, 4,577,114, Cl. 250-551.000.
Oertli, Robert, to Solco Basel AG. Process for the preparation of a biologically active extract. 4,576,696, Cl. 204-182.600.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Heat-recoverable article. 4,576,871, Cl. 428-521.000.
Oetiker, Hans. Coupling for pressure gas lines. 4,576,359, Cl. 251-149.600.
O'Fearna, Patrick J. Portable wind screen. 4,576,364, Cl. 256-24.000.
Ogata, Kojiro: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Solid-state image sensor with a phototropic or fluorescent layer. 4,577,098, Cl. 250-216.000.
Ogawa, Kazuyoshi: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, 4,577,154, Cl. 328-158.000.
Ogawa, Yoshiyuki; Uno, Hideaki; and Baba, Misao, to Yokogawa Medical Systems, Limited. Table mechanism. 4,576,368, Cl. 269-322.000.
Ogden, Ralph, to Ajay Enterprises Corp. Exercise treadmill. 4,576,352, Cl. 248-188.400.
Oguino, Masanori, to Hitachi, Ltd. Image projection apparatus. 4,576,442, Cl. 350-418.000.
Oguri, Katsuhiko: *See*—
Sato, Kazuhiro; and Oguri, Katsuhiko, 4,577,250, Cl. 360-112.000.
Ogushi, Tetsurou; and Murakami, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Heat transmission device. 4,576,009, Cl. 62-3.000.
Ohara, Muneyuki: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.
Ohara, Yoshio: *See*—
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yashio; and Iizumi, Toyoko, 4,577,025, Cl. 546-198.000.

Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, to Hitachi, Ltd. High sensitivity solid-state imaging device. 4,577,231, Cl. 358-212.000.

Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, to Toray Industries, Inc. Ultrasonic transducer employing piezoelectric polymeric material. 4,577,132, Cl. 310-800.000.

Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, to Kawasaki Seitetsu Kabushiki Kaisha; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Grinding machine for use with rolling mill. 4,575,972, Cl. 51-251.000.

Ohnishi, Yutaka, to Tachikawa Spring Co., Ltd. Fillet-welding equipment for pipe materials. 4,576,323, Cl. 228-29.000.

Ohno, Jiro: *See—*
Suzuki, Ryoichi; Ohno, Jiro; and Gondo, Hisashi, 4,576,639, Cl. 75-123.00E.

Ohshima, Satoshi: *See—*
Wagatsuma, Mitsuyoshi; Hatsuno, Susumu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,576,938, Cl. 514-206.000.

Ohta, Yukitake; and Fukunaga, Yasuo, to Allied Corporation. Connector for fibre optic cable. 4,576,437, Cl. 350-96.200.

Ohtsuki, Zenju: *See—*
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,577,188, Cl. 340-721.000.

Ohzawa, Yoshiyuki: *See—*
Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, 4,576,735, Cl. 252-512.000.

Oishi, Hiroshi: *See—*
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.

Oishi, Keiji: *See—*
Fukuchi, Masakazu; and Oishi, Keiji, 4,576,466, Cl. 355-3.0DD.

Oishibashi, Hirotsugu: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.

Oiso, Kazumasa: *See—*
Takeuchi, Takashi; Nishimura, Keizo; Kobayashi, Masaharu; and Oiso, Kazumasa, 4,577,319, Cl. 371-38.000.

Okada, Shinichi, to Canon Denshi Kabushiki Kaisha. Magnetic disc cassette having disc flattening means. 4,577,251, Cl. 360-133.000.

Okamura, Haruki: *See—*
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, 4,576,734, Cl. 252-404.000.

O'Kane, James L.: *See—*
Benton, Kenneth C.; and O'Kane, James L., 4,577,008, Cl. 526-342.000.

Okaniwa, Kenichiro: *See—*
Koyama, Mikio; Okaniwa, Kenichiro; and Saruhashi, Masakuni, 4,576,793, Cl. 422-56.000.

Okauchi, Ken: *See—*
Goto, Sohei; and Okauchi, Ken, 4,576,909, Cl. 430-546.000.

Okaya, Takuji: *See—*
Tanaka, Yoshinari; Aoyama, Akimasa; Moritani, Takeshi; Satoh, Kenji; and Okaya, Takuji, 4,576,988, Cl. 524-503.000.

Oki Electric Industry Co., Ltd.: *See—*
Isobe, Minoru, 4,576,490, Cl. 400-82.000.

Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, to Inoue MTP Co., Ltd.; and Sanyo Chemical Industries, Ltd. Coating composition and skinned polyurethane foam articles coated therewith. 4,576,855, Cl. 428-215.000.

Okino, Tadashi; and Saito, Syuichiro, to Canon Kabushiki Kaisha. Image sensing system. 4,576,456, Cl. 352-216.000.

Okita, Tsutomu; Tsuji, Nobuo; and Mukaida, Yoshito, to Fuji Photo Film Co., Ltd. Magnetic recording material. 4,576,866, Cl. 428-336.000.

Oko, Uriel M.; and Baldwin, Robert M., to Cities Service Oil & Gas Corp. Beneficiation of shale kerogen and its conversion into shale oil. 4,576,708, Cl. 208-11.0LE.

Okubo, Misae: *See—*
Harada, Tokuya; Higashiura, Tadashi; and Okubo, Misae, 4,576,915, Cl. 435-101.000.

Okuda, Akihide: *See—*
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.

Oldani, Gaetano. Self-propelled pedestrian-controlled tractor for towing helicopters. 4,576,245, Cl. 180-14.100.

Olierook, John C. J.: *See—*
Koken, Karel G. M.; van de Kerkhof, Hubertus F. W.; Olierook, John C. J.; and Beyersbergen van Henegouwen, Cornelis M., 4,576,345, Cl. 242-198.000.

Olin Corporation: *See—*
Butt, Sheldon H., 4,577,056, Cl. 174-52.0FP.

Oliver, John B.: *See—*
Smallhorn, Edward A.; and Oliver, John B., 4,576,204, Cl. 138-44.000.

Oliver, Stephen N.: *See—*
Baskerville, Martin W.; Maltman, William R.; and Oliver, Stephen N., 4,576,766, Cl. 264-1.400.

Oliver, Vincent S.; Tames, Walter; Prochaska, Helmuth H.; and Wieser, Karl-Heinz, to Mobay Chemical Corporation. Color enhanced permanent pigments from precipitated cationic dyes. 4,576,649, Cl. 106-308.00Q.

Olivier, Paul D.; and Chadbourne, Lester E., deceased (by Chadbourne, Mary T., personal representative), to Garrett Corporation, The. Turbo machine blading. 4,576,551, Cl. 416-191.000.

Olsen, Steen H.: *See—*
Neldeberg, Poul; and Olsen, Steen H., 4,576,332, Cl. 237-2.00B.

Olson, Gene R.; and Sorenson, Gregg R. Automatic welding machine. 4,577,089, Cl. 219-124.220.

Olsson, Olle G.; Yaman, Melih; Waldenstrom, Mats G.; and Fischer, Udo K. R., to Santrade Ltd. Weldable wear part with high wear resistance. 4,576,875, Cl. 428-627.000.

Olympia Werke AG: *See—*
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, 4,577,200. Cl. 346-140.00R.

Olympus Optical Co., Ltd.: *See—*
Hashiguchi, Toshihiko, 4,576,147, Cl. 128-6.000.
Ikari, Kazuo, 4,576,448, Cl. 350-465.000.
Ishii, Fumiaki, 4,576,144, Cl. 128-4.000.
Kobayashi, Minoru, 4,577,252, Cl. 360-137.000.
Nemoto, Shigeru; Kitajima, Goro; Saitou, Sinichi; and Osada, Hazime, 4,577,245, Cl. 360-93.000.
Nishioka, Kimihiko, 4,576,435, Cl. 350-96.260.
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,576,650, Cl. 134-22.120.
Yoshikawa, Shoji; and Sakamoto, Masaharu, 4,577,320, Cl. 372-29.000.

Omata, Nobuaki, to Nifco Inc. Rotation damper. 4,576,252, Cl. 185-39.000.

Omation Corporation: *See—*
Bingham, George H.; Krupotich, Edward A.; and Rosensweig, Burton J., 4,576,287, Cl. 209-601.000.

Omodei-Sale', Amedeo: *See—*
Favara, Duccio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,576,746, Cl. 260-239.00A.

Omori, Hiroshi: *See—*
Anahara, Meiji; and Omori, Hiroshi, 4,575,999, Cl. 57-333.000.

Omoto, Takahiro: *See—*
Murata, Shouichi; Makiyama, Muneto; Omoto, Takahiro; and Yasumoto, Taizo, 4,576,840, Cl. 428-16.000.

Omura, Isamu: *See—*
Sano, Yoshiaki; Omura, Isamu; and Hiramatsu, Ryo, 4,577,121, Cl. 307-355.000.

Ono, Yasuichi, to Alps Electric Co., Ltd. Hot-melt adhesive. 4,576,985, Cl. 524-407.000.

Onozato, Takashi: *See—*
Sugawara, Fukuo; Iwane, Yasuhiko; Hori, Fumihisa; and Onozato, Takashi, 4,576,492, Cl. 400-146.000.

Opsahl, Allan W., to Boeing Company, The. Flap torque tube slot seal. 4,576,347, Cl. 244-130.000.

Orain, Michel A., to Uni-Cardan Aktiengesellschaft. Torque transmission assembly. 4,576,503, Cl. 403-259.000.

Orikawa, Michihiro: *See—*
Yoda, Yasutada; Sueyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, 4,576,559, Cl. 425-28.00R.

Ortho Pharmaceutical Corporation: *See—*
Dyck, Manfred F.; and Haine, Walter A., 4,576,156, Cl. 128-132.00R.

Osada, Hazime: *See—*
Nemoto, Shigeru; Kitajima, Goro; Saitou, Sinichi; and Osada, Hazime, 4,577,245, Cl. 360-93.000.

Osborne, Robert E.: *See—*
Wooldridge, James E.; Osborne, Robert E.; and Sexton, Robert W., 4,576,618, Cl. 55-122.000.

Ost, Clarence S. Secure cable television access system with tiering control. 4,577,224, Cl. 358-114.000.

Osterloh, Rolf: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,576,979, Cl. 523-404.000.

Osthoff, Heinrich: *See—*
Bauer, Kurt H.; Ghyczy, Miklos; Etschenberg, Eugen; and Osthoff, Heinrich, 4,576,626, Cl. 71-28.000.

Otis Engineering Corporation: *See—*
Cox, Don C., 4,576,254, Cl. 188-67.000.

Otobe, Yutaka: *See—*
Yamato, Akihiro; and Otobe, Yutaka, 4,576,134, Cl. 123-480.000.

Otsuka, Shigeru, to NEC Corporation. Power saving system for time-division multiple access radiocommunication network. 4,577,315, Cl. 370-95.000.

Otting, Billy J.: *See—*
Thurman, Lamar; Otting, Billy J.; and Otting, David L., 4,576,020, Cl. 68-205.00R.

Otting, David L.: *See—*
Thurman, Lamar; Otting, Billy J.; and Otting, David L., 4,576,020, Cl. 68-205.00R.

Otting International, Inc.: *See—*
Thurman, Lamar; Otting, Billy J.; and Otting, David L., 4,576,020, Cl. 68-205.00R.

Ottle, Walter: *See—*
Worner, Siegfried; Ottle, Walter; and Klein, Herbert, 4,576,799, Cl. 422-176.000.

Otuka, Shinpei; Kawai, Kozo; and Kusunoki, Toshio, to Matsushita Electric Works, Ltd. Massager. 4,576,149, Cl. 128-33.000.

Oura, Toshio, to Nippon Electric Co. Ltd. Sound synthesizer. 4,577,343, Cl. 381-51.000.

Ovchar, Vladimir G.: *See*—
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.

Ovren, Christer: *See*—
Adolfsson, Morgan; Brogardh, Iorgny; and Ovren, Christer, 4,577,189, Cl. 340-794.000.

Owens-Corning Fiberglas Corporation: *See*—
Chappelear, Robert N.; and Symborski, Alex P., 4,576,621, Cl. 65-10.200.

Owens, Phillip M., to SCM Corporation. Adhesion promoters for sanitary can coatings. 4,576,695, Cl. 204-181.400.

Oy Tampella AB: *See*—
Issakainen, Onni; and Heikkila, Pertti, 4,576,525, Cl. 405-269.000.

Oyachi, Tomio; Fukuda, Hiroya; and Anami, Masahiko, to Bridgestone Corporation. Radio wave shielding materials and a method of producing the same. 4,576,859, Cl. 428-311.100.

Oyama, Yoshishige: *See*—
Yamauchi, Teruo; Nogi, Toshiharu; and Oyama, Yoshishige, 4,576,136, Cl. 123-590.000.

Ozaki, Toshifumi: *See*—
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.

Ozaki, Yuzo: *See*—
Watanabe, Masato; and Ozaki, Yuzo, 4,576,726, Cl. 252-62.540.

Ozasa, Susumu: *See*—
Saitou, Norio; Ozasa, Susumu; and Matsuzaka, Takashi, 4,577,111, Cl. 250-492.200.

Ozawa, Akimasa: *See*—
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.

Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; and Takemoto, Iwao, to Hitachi, Ltd. Solid state imaging device. 4,577,230, Cl. 358-212.000.

Pace, Noel M., to Hewlett-Packard Company. Low drift broadband amplifier. 4,577,159, Cl. 330-9.000.

Packham, Charles C., to Gillette Company, The. Dry shavers. 4,575,941, Cl. 30-346.510.

Padgett, Thomas M.: *See*—
Dillon, Larry W.; Jamerson, Robert L.; and Padgett, Thomas M., 4,576,848, Cl. 428-89.000.

Paech, Hartmut: *See*—
Steiner, Helmut; Ebbinghaus, Wilfried; and Paech, Hartmut, 4,576,488, Cl. 384-291.000.

Pai, Damodar M.: *See*—
Badesha, Santokh S.; Pai, Damodar M.; Carmichael, Kathleen M.; and Tarnawskyj, Ihor W., 4,576,634, Cl. 75-0.50A.

Palayiwa, Eileen: *See*—
Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J., 4,576,159, Cl. 128-203.140.

Palmer, David N., to Combustion Engineering, Inc. Synthesis of carbon-containing intercalatable layered transition metal chalocogenides. 4,576,697, Cl. 204-192.00N.

Palmer, Harold A.: *See*—
Dowling, Donald J.; and Palmer, Harold A., 4,576,231, Cl. 166-248.000.

Palmer, Joseph G.: *See*—
Iovine, Carmine P.; Palmer, Joseph G.; and Walker, James L., 4,577,031, Cl. 548-319.000.

Panavision, Inc.: *See*—
Fazekas, Carl F., 4,576,455, Cl. 352-78.00R.

Pancook, James J., to Columbus McKinnon Corporation. Lever-operated hoist or puller. 4,576,363, Cl. 254-372.000.

Panhandle Industries, Inc.: *See*—
Hidle, Jerry, 4,575,890, Cl. 15-104.00A.

Pann, Keh: *See*—
Kalkomey, Cynthia T.; Mason, Thomas J.; and Pann, Keh, 4,577,297, Cl. 367-24.000.

Panock, Richard L.: *See*—
Forrest, Stephen R.; and Panock, Richard L., 4,577,209, Cl. 357-30.000.

Panzarella, James S., to Quaker Oats Company, The. Toy bubble-blowing lawn mower. 4,576,582, Cl. 446-16.000.

Parg, Adolf; Hamprecht, Gerhard; Sauter, Hubert; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Substituted 4,5-dimethoxypyridazones, herbicides containing these compounds, and their use for controlling undesirable plant growth. 4,576,630, Cl. 71-92.000.

Pargee, Robert W., Jr., to EECO Incorporated. Matrix control method and apparatus. 4,577,191, Cl. 340-825.790.

Paris, Claude: *See*—
Hardouin, Pierre; Lameyre, Felix; and Paris, Claude, 4,576,429, Cl. 339-95.00D.

Paris, Jean. Foot retention device for ski boot. 4,575,956, Cl. 36-119.000.

Paris, Jean-Marc: *See*—
Bourzat, Jean-Dominique; Cotrel, Claude; Farge, Daniel; Paris, Jean-Marc; and Taurand, Gerard, 4,576,954, Cl. 514-314.000.

Park, David B.; Snyder, James R.; McDonald, Gerard J.; and Hoet, Roland, to Park, David B. Conveyor system with removable wear members. 4,576,277, Cl. 198-803.010.

Park-Ohio Industries, Inc.: *See*—
Balzer, Norbert R., 4,577,081, Cl. 219-10.690.

Parker, John G.; and Stanbro, William D., to Johns Hopkins University, The. Electro-optical device and method for monitoring instanteous singlet oxygen concentration produced during photoradistion using a CW excitation source. 4,576,173, Cl. 128-633.000.

Parker, Robert R.; and DiGianfilippo, Dominic J., to Bell & Howell Company. Interactive training apparatus. 4,576,578, Cl. 434-307.000.

Parks, Gerald R.: *See*—
Dawson, Chris R.; Dondero, John; and Parks, Gerald R., 4,575,875, Cl. 2-422.000.

Parren, Joseph R. Decorative holder. 4,576,839, Cl. 428-13.000.

Parry, Lawrence J.; and Morrison, Bruce J., to Morrison, Bruce J. Pesticidal sheets or containers. 4,576,801, Cl. 427-288.000.

Partin, Dale L., to General Motors Corporation. Lead-ytterbium-tin telluride heterojunction semiconductor laser. 4,577,322, Cl. 372-44.000.

Pascoe, William M., Sr., to Milliken Research Corporation. Method for producing random-appearing patterns on fabric: nodes and line segments. 4,576,611, Cl. 8-482.000.

Passat Maschinenbau GmbH: *See*—
Bernecker, Gerhard, 4,575,949, Cl. 34-14.000.

Passemard, Jean-Robert; and Keledjian, Gaston, to Regie Nationale des Usines Renault. Swivelling handle with three axes of rotation for an industrial robot. 4,576,544, Cl. 414-735.000.

Paszek, Leon E.; and Gebbia, Barbara, to Sterling Drug Inc. Liquid disinfectant laundry detergents. 4,576,729, Cl. 252-106.000.

Patchett, Arthur A.: *See*—
Greenlee, William J.; and Patchett, Arthur A., 4,576,748, Cl. 260-239.00A.

Patel, Kishor J.: *See*—
Janecke, James P.; and Patel, Kishor J., 4,576,200, Cl. 137-624.130.

Paul, Jon D.: *See*—
Levy, Alfred; and Paul, Jon D., 4,577,067, Cl. 179-99.00H.

Pawloski, James C.: *See*—
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,576,721, Cl. 210-640.000.

Payne, G. Houson, III: *See*—
Fulbright, Thomas G.; and Payne, G. Houson, III, 4,576,495, Cl. 400-328.000.

Peck, Lawrence J.; and Kreisher, John H., to International Biotechnologies, Inc. Analytical electroelution device. 4,576,702, Cl. 204-299.00R.

Peck, Lawrence J.; Kreisher, John H.; and Walker, Alan L., to International Biotechnologies, Inc. Preparatory electroelution device. 4,576,703, Cl. 204-299.00R.

Pedain, Josef: *See*—
Noll, Klaus; Potter, Terry; Pedain, Josef; and Schwindt, Jurgen, 4,576,989, Cl. 524-591.000.

Pelam, Inc.: *See*—
McCormick, James B., 4,576,796, Cl. 422-99.000.

Pellico, Michael A.: *See*—
Montgomery, Robert E.; and Pellico, Michael A., 4,576,817, Cl. 424-94.000.

Pencept, Inc.: *See*—
Blesser, Barry, 4,577,057, Cl. 178-18.000.

Penlon Limited: *See*—
Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J., 4,576,159, Cl. 128-203.140.

Pentz, William J.: *See*—
Huffman, George W.; Pentz, William J.; Vietti, David E.; and Wuskell, Joseph P., 4,577,035, Cl. 549-472.000.

Percival, George E. Modular display unit for articles of merchandise. 4,576,292, Cl. 211-49.100.

Perkins, Earl, to Touchstone Corporation. Method and composition for cleaning and protecting metal. 4,576,730, Cl. 252-174.140.

Perna, Giorgino, to Newellpharma s.r.l. Process for manufacturing investment molds. 4,576,216, Cl. 164-21.000.

Perron, Robert: *See*—
Gauthier-Lafaye, Jean; and Perron, Robert, 4,576,809, Cl. 423-418.000.

Perrone, Ettore: *See*—
Alpegiani, Marco; Bedeschi, Angelo; Foglio, Maurizio; Franceschi, Giovanni; and Perrone, Ettore, 4,577,016, Cl. 544-182.000.

Perryman, Raymond A. G.: *See*—
Needham, James C.; Rivett, Robert M.; and Perryman, Raymond A. G., 4,577,086, Cl. 219-117.100.

Personal Products Company: *See*—
Tritsch, Ludwig, 4,576,598, Cl. 604-390.000.

Persson, Thomas B. Process for sealing the end of insulated pipes which have a number of monitoring wires, and means for carrying out the process. 4,576,661, Cl. 156-48.000.

Petch, David B.: *See*—
Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., 4,576,148, Cl. 128-26.000.

Peter, Heinz: *See*—
Fryberg, Mario; Schaller, Heinrich; Steiger, Rolf; and Peter, Heinz, 4,576,885, Cl. 430-390.000.

Peters, Hubertus: *See*—
Bechem, Werner; Peters, Hubertus; Solms, Jurgen; and Wolfhard, Dietrich, 4,576,684, Cl. 204-28.000.

Peterson, Joe W., to Motorola, Inc. Clocked gain stage having differential inputs and outputs. 4,577,162, Cl. 330-253.000.

Peterson, Ralph W.: *See*—
Ho, Gary S.; and Peterson, Ralph W., 4,577,274, Cl. 364-200.000.

Petrarch Systems Inc.: *See*—
Arkles, Barry C.; and Hamon, Burrell N., 4,577,039, Cl. 556-409.000.

Petre, Tommy: *See*—
Katzeff, Kurt; and Petre, Tommy, 4,577,061, Cl. 179-2.0AM.

Petrini, Roland, to Salomon S.A. Rear entry ski boot. 4,575,957, Cl. 36-121.000.

Pettinari, Maurizio: *See*—
Bernardi, Dario; and Pettinari, Maurizio, 4,576,564, Cl. 425-337.000.

Pevzner, Boris, to Union Carbide Corporation. Cryogenic liquid pump. 4,576,557, Cl. 417-539.000.

Pfaff Industriemaschinen GmbH: *See*—
Albrecht, Ernst; and Busch, Edgar, 4,576,103, Cl. 112-73.000.

Pfizer Inc.: *See*—
Eggler, James F.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,576,964, Cl. 514-546.000.

Pham, Van Doan, to Alsthom-Atlantique. High voltage gas-blast circuit breaker. 4,577,074, Cl. 200-148.00A.

Pharmometrics Corporation: *See*—
Westerman, S. Thomas, 4,576,184, Cl. 128-733.000.

Philamon Incorporated: *See*—
Grib, Boris F., 4,577,164, Cl. 331-109.000.

Philipp, Clemens: *See*—
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,576,218, Cl. 164-431.000.

Phillips Petroleum Company: *See*—
Burgess, Kenneth W.; Bryant, William R.; and Erickson, Wayne K., 4,576,852, Cl. 428-171.000.
Miles, John M., 4,575,950, Cl. 34-27.000.
Schsbron, John F., 4,576,917, Cl. 436-85.000.

Phillips, Victor R.: *See*—
Cowlam, Stephen K.; Moss, Steven Y.; Stockwell, Claude L.; and Phillips, Victor R., 4,576,765, Cl. 210-801.000.

Phone-Poulenc Sante: *See*—
Bourzat, Jean-Dominique; Cotrel, Claude; Farge, Daniel; Paris, Jean-Marc; and Taurand, Gerard, 4,576,954, Cl. 514-314.000.

Piazza, Pietro: *See*—
Amici, Francis R.; Berger, Hans S.; Farrington, Richard I.; and Piazza, Pietro, 4,576,586, Cl. 446-315.000.

Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Miticidal 2-(2-alkyl-2,3-dihydrobenzofuran-7-yl)-N-alkoxy-N-alkyldiazenecarboxamides. 4,577,011, Cl. 534-787.000.

Pinnow, Curtis C.; and Gill, Brian, to Carter-Hoffman Corporation. Food service cart door structure. 4,576,425, Cl. 312-324.000.

Pinson, George T., to Boeing Company, The. System for providing electrical energy to a missile and the like. 4,577,116, Cl. 290-43.000.

Pioneer Electronic Corporation: *See*—
Kuroda, Kazuo, 4,577,158, Cl. 329-104.000.
Matsuki, Seiichiro, 4,577,246, Cl. 360-96.500.

Piper, James R. Heating system. 4,576,333, Cl. 237-49.000.

Pithouse, Kenneth B.: *See*—
Harris, Richard J.; Pithouse, Kenneth B.; and Van Dijck, Frans S. J., 4,576,666, Cl. 156-85.000.

Pitney Bowes Inc.: *See*—
Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward E., 4,577,283, Cl. 364-464.000.

Pitzenberger, Steven M., to Merck & Co., Inc. Tryptophan derivative. 4,576,750, Cl. 260-239.30D.

Piwinski, John J.: *See*—
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,576,941, Cl. 514-222.000.

PKG Trading Company, Inc.: *See*—
Griffin, Donnie R., 4,575,964, Cl. 42-94.000.

Plard, Christian; and Soulie, Jacques, to Electricite de France; and Spie-Batignolles. Device for electric heating of a gas mixture by direct Joule effect. 4,577,093, Cl. 219-376.000.

Plessey Company PLC, The: *See*—
Baskerville, Martin W.; Maltman, William R.; and Oliver, Stephen N., 4,576,766, Cl. 264-1.400.

Plessey Overseas Limited: *See*—
Eaton, Ralph M.; and Geen, Michael W., 4,576,224, Cl. 165-80.200.

Plessey South Africa Limited: *See*—
Schreuder, Jan, 4,577,150, Cl. 324-83.00R.

Plicchi, Gianni; and Canducci, Giancarlo. Electronic circuit for monitoring respiratory parameter for controlling operation of implantable medical device. 4,576,183, Cl. 128-723.000.

Plitt, Uwe: *See*—
Mathewes, Wolfgang; Fitzner, Klaus; and Plitt, Uwe, 4,576,088, Cl. 98-119.000.

Plotkin, George M.: *See*—
Lettvin, Jerome Y.; and Plotkin, George M., 4,577,160, Cl. 330-149.000.

Plouck, Richard E.: *See*—
Baltz, James P.; and Plouck, Richard E., 4,576,270, Cl. 192-150.000.

Plumet, Lucien: *See*—
Hageman, Jacques; Plumet, Lucien; and Robberechts, Marcel, 4,576,609, Cl. 8-103.000.

Plumly, George W., to Plumly Lighting Corporation. Lighting apparatus and system utilizing miniature incandescent lamps. 4,577,264, Cl. 362-252.000.

Plumly Lighting Corporation: *See*—
Plumly, George W., 4,577,264, Cl. 362-252.000.

Pohoreski, Anton P., to Continental Manufacturing and Sales Inc. System for the clarification of sewage and other liquid-containing wastes. 4,576,714, Cl. 210-195.100.

Pol, Vincent; and Dumas, Jean-Claude, to Clinique de la Residence du Parc. Implantable blood pump. 4,576,606, Cl. 623-3.000.

Polansky, Theodore J., to SmithKline Beckman Corporation. 7-D-Mandelamido-3(1-sulfomethyltetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid monosodium salt. 4,576,937, Cl. 514-204.000.

Polychrome Corporation: *See*—
Golda, Eugene; and Wilkes, Alan, 4,576,892, Cl. 430-157.000.

Pomper, Michael: *See*—
Frosien, Jurgen; and Pomper, Michael, 4,577,147, Cl. 324-71.300.

Popa, Frank D.: *See*—
Alsop, Brian H.; Popa, Frank D.; and Edwards, William E., 4,576,787, Cl. 376-447.000.

Pope, Douglas R. Receptacle support. 4,576,388, Cl. 280-33.99F.

Popendiker, Kurt: *See*—
Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, 4,576,947, Cl. 514-263.000.

Porta Systems Corp.: *See*—
DeLuca, Paul V.; and Hung, Peter, 4,576,428, Cl. 339-94.00R.

Porter, Michael J.: *See*—
Porter, William F.; Porter, Michael J.; and Johnson, Dwight E., 4,576,620, Cl. 65-9.000.

Porter, Robert B., Jr.: *See*—
Molnar, John; and Porter, Robert B., Jr., 4,576,414, Cl. 297-476.000.

Porter, William F.; Porter, Michael J.; and Johnson, Dwight E., to United States Gypsum Company. Apparatus for the production of mineral fibers having supplemental collection chamber exhaust. 4,576,620, Cl. 65-9.000.

Porter, William H. Building structure. 4,575,974, Cl. 52-86.000.

Porter, William H. Roof panel construction. 4,575,981, Cl. 52-309.900.

Position Orientation Systems, Ltd.: *See*—
Hansen, Per K., 4,576,481, Cl. 356-375.000.

Post, Steven W., to FMC Corporation. Arrangement for operating dual fluid systems. 4,576,337, Cl. 239-127.000.

Poth, Ulrich; and Hille, Hans-Dieter, to BASF Farben & Fasern Aktiengesellschaft. Coating composition process for the preparation of coatings and coated substrate. 4,576,868, Cl. 428-423.100.

Potter, Terry: *See*—
Noll, Klaus; Potter, Terry; Pedain, Josef; and Schwindt, Jurgen, 4,576,989, Cl. 524-591.000.

Poulin, Benoit L.: *See*—
Levine, Herbert R.; Gerrato, Stephen G.; and Poulin, Benoit L., 4,576,207, Cl. 138-177.000.

Powell, Larry D.; and Tidwell, Charles J., Jr., to Mohasco Corporation. Convertible sofabed with improved user comfort. 4,575,883, Cl. 5-13.000.

Praderio, Joseph J.: *See*—
Kraus, Robert G.; Kunica, Enora S.; and Praderio, Joseph J., 4,576,589, Cl. 604-8.000.

Prasad, Arun, to Jeneric Industries, Inc. Grain-refined gold-free dental alloys for porcelain-fused-to-metal restorations. 4,576,789, Cl. 420-464.000.

Press, Jeffery B.: *See*—
Marsico, Joseph W., Jr.; Wright, William B., Jr.; and Press, Jeffery B., 4,576,957, Cl. 514-383.000.

Preusker, Werner, to Niveau AG. Non-skid device, particularly for pneumatically tired vehicles wheels used on ice and snow. 4,576,214, Cl. 152-213.00A.

Pritchard, Dalton H., to RCA Corporation. Progressive scan video processor having common memories for video interpolation and speed-up. 4,577,225, Cl. 358-140.000.

Prival, Harri G.: *See*—
Hopper, Michael G.; and Prival, Harri G., 4,577,273, Cl. 364-200.000.

Prochaska, Helmuth H.: *See*—
Oliver, Vincent S.; Tames, Walter; Prochaska, Helmuth H.; and Wieser, Karl-Heinz, 4,576,649, Cl. 106-308.00Q.

Procter & Gamble Company, The: *See*—
Matthews, Randall S., 4,576,962, Cl. 514-530.000.
Stoddart, Barry, 4,576,728, Cl. 252-102.000.

Product Investment Incorporated: *See*—
Henning, John C., 4,576,304, Cl. 220-269.000.

Prokop, George S.: *See*—
Hueckel, Gary R.; and Prokop, George S., 4,577,212, Cl. 357-68.000.

Promocab, S.A.: *See*—
Fontaine, Guy; and Achard, Serge, 4,577,183, Cl. 340-541.000.

Prosenbauer, Otto, to Inject Star Pokelmaschinen GmbH. Apparatus for severing the meat from bones. 4,575,899, Cl. 17-1.00G.

Proto-Med. Inc.: *See*—
Mottram, William R.; Fisher, Gene A.; and Feierabend, Louis, 4,576,616, Cl. 55-68.000.

Proud, Todd A.; Lin, Tom F.; Mitchell, Wayne J.; and Kasper, James D., to Terumo Medical Corporation. Collection device for capillary blood. 4,576,185, Cl. 128-760.000.

Pryor, Timothy R., to Diffracto Ltd. Electro-optical inspection. 4,576,482, Cl. 356-376.000.

Przyklek, Rosemary: *See*—
Gunther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, 4,576,905, Cl. 430-401.000.

Puritch, George S.; and Kondo, Edward S., to Safer Agro-Chem Ltd. Alkyl pyridinium synergists for benzimidazole pesticides. 4,576,950, Cl. 514-358.000.

Putman, Richard E., to Westinghouse Electric Corp. Control system for fluid flow distribution. 4,577,280, Cl. 364-494.000.

Pyle, Stoddard H., to Speed Cut, Inc. Multiple intersecting planes cutting device. 4,576,076, Cl. 83-471.300.

Quaglino, Marino: *See*—
Bottazzini, Nicola; and Quaglino, Marino, 4,577,010, Cl. 528-487.000.

Quaker Oats Company, The: *See*—
Panzarella, James S., 4,576,582, Cl. 446-16.000.

Quinlan, Robert L., Jr., to Gerber Products Company. Height adjustment apparatus. 4,576,392, Cl. 280-87.02W.

R. F. Monolithics, Inc.: *See*—
Hartmann, Clinton S., 4,577,168, Cl. 333-170.000.

R. J. Reynolds Tobacco Company: *See*—
Deal, Philip A., 4,576,187, Cl. 131-336.000.

Rachwal, Anthony J.: *See*—
Hurley, Brian J. E.; and Rachwal, Anthony J., 4,576,719, Cl. 210-620.000.

Rader, Helmut. Drinker shroud. 4,576,119, Cl. 119-81.000.

Radiometer A/S: *See*—
Aas, Flemming; and Jeppesen, Borge, 4,576,595, Cl. 604-256.000.

Radke, Dietrich: *See*—
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.

Raghuprasad, Puthalath K. Oral inhalation apparatus. 4,576,157, Cl. 128-200.230.

Ragsdale, William A., to Intermetrics, Inc. Area navigational system. 4,577,194, Cl. 343-401.000.

Raher, Loic: *See*—
Gallas, Gerard; Raher, Loic; and Renzo, Bernard, 4,576,366, Cl. 267-8.00R.

Raible, Thomas: *See*—
Wittwer, Fritz; and Raible, Thomas, 4,576,284, Cl. 206-530.000.

Raines, Charles D.: *See*—
Schilling, Hugh K.; Dayen, Leonid; and Raines, Charles D., 4,576,266, Cl. 192-70.120.

Rajbenbach, Henri: *See*—
Huignard, Jean P.; Rajbenbach, Henri; Loiseaux, Brigitte; and Herriau, Jean P., 4,576,434, Cl. 350-3.640.

Ralph McKay Limited: *See*—
Young, Hartley F., 4,576,334, Cl. 238-310.000.

Ramaker, Hermann: *See*—
Erdmann, Hermann; and Ramaker, Hermann, 4,576,105, Cl. 114-333.000.

Ramakers, Johannes A. H. M.: *See*—
Hupperetz, Willem J. H.; and Ramakers, Johannes A. H. M., 4,577,017, Cl. 544-193.000.

Randall Corporation, The: *See*—
Netzer, David; and Huebel, Robert R., 4,576,615, Cl. 55-43.000.

Randall Equipment Company: *See*—
Duda, Henry J., 4,576,192, Cl. 135-89.000.

Ranz, Erwin: *See*—
Kampfer, Helmut; Langen, Hans; and Ranz, Erwin, 4,576,907, Cl. 430-507.000.

Rasmussen, George P.; and Grimmett, Earl S., to Waste-Tech Services, Inc. Removal of tramp material from fluid bed vessels. 4,576,102, Cl. 110-346.000.

Rasmussen, Poul R.: *See*—
Lorck, Henning O. B.; and Rasmussen, Poul R., 4,576,961, Cl. 514-462.000.

Rassieur, Charles L., to Central Mine Equipment. Assembly structure for a soil sampler. 4,576,498, Cl. 403-24.000.

Rau, Jim L.; and LaHue, Ronald L., to TRW Inc. Hybrid load-sense vehicle hydrostatic steering system. 4,576,003, Cl. 60-384.000.

Ravel, Kanak K. R.; Vaidya, Bhupendra R.; and Nerizon, Nelly A., to Block Drug Co., Inc. Whipped gel composition. 4,576,645, Cl. 106-125.000.

Ray, Ranjan, to Allied Corporation. Method of making complex boride particle containing alloys. 4,576,653, Cl. 148-3.000.

Ray, Sudipta K.: *See*—
Lewis, Robert K.; and Ray, Sudipta K., 4,576,659, Cl. 148-127.000.

Raychem Limited: *See*—
Harris, Richard J.; Pithouse, Kenneth B.; and Van Dijck, Frans S. J., 4,576,666, Cl. 156-85.000.
Tamplin, Paul; and Heaven, Malcolm D., 4,576,993, Cl. 525-240.000.

Rayment, Arthur G., to Lamb-Weston, Inc. Food product defect sensor and trimmer apparatus. 4,576,071, Cl. 83-71.000.

RCA Corporation: *See*—
Avins, Jack, 4,577,226, Cl. 358-143.000.
Easter, Finis C.; and Aires, Ramon H., 4,577,268, Cl. 363-21.000.
Gale, Michael T.; Knop, Karl H.; and Ebnother, Martin, 4,576,439, Cl. 350-162.230.
Gurumurthy, Kadagattor V., 4,577,227, Cl. 358-147.000.
Harlan, Wayne E., 4,577,234, Cl. 358-243.000.
Hawrylo, Frank Z., 4,576,326, Cl. 228-171.000.
Kaganowicz, Grzegorz; Robinson, John W.; and Thomas, John H., III, 4,576,829, Cl. 427-39.000.
Kaiser, Donald B., 4,577,137, Cl. 313-533.000.
Pritchard, Dalton H., 4,577,225, Cl. 358-140.000.
Reed, Frank R., 4,577,130, Cl. 310-194.000.
Rentsch, Edward M.; and Freedman, Larry A., 4,577,115, Cl. 250-578.000.
Schiff, Leonard N., 4,577,316, Cl. 370-104.000.
Stewart, Roger G.; and Ipri, Alfred C., 4,577,215, Cl. 357-23.500.

Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,576,633, Cl. 71-93.000.

Redick, Hugh E., to Du Pont de Nemours, E. I., and Company. Carbon fiber production. 4,576,810, Cl. 423-447.100.

Redick, Hugh E.: *See*—
Riggs, Dennis M.; and Redick, Hugh E., 4,576,811, Cl. 423-447.200.

Reed, Frank R., to RCA Corporation. Pancake motor with insitu wound bobbinless stator coils. 4,577,130, Cl. 310-194.000.

Reed, Joseph, to International Telephone and Telegraph Corporation. Zero IF receiver AM/FM/PM demodulator using sampling techniques. 4,577,157, Cl. 329-50.000.

Reed, Mark A.; and Bate, Robert T., to Texas Instruments Incorporated. Process for fabricating quantum-well devices utilizing etch and refill techniques. 4,575,924, Cl. 29-576.00E.

Regie Nationale des Usines Renault: *See*—
Passemard, Jean-Robert; and Keledjian, Gaston, 4,576,544, Cl. 414-735.000.
Renevot, Gerard, 4,576,617, Cl. 55-96.000.

Regina, Ruth. Partial wig assembly with extension portion. 4,576,189, Cl. 132-53.000.

Region Wallone: *See*—
Boland, Michel A. G., 4,576,158, Cl. 128-92.00R.

Rehm, Josef: *See*—
Heigl, Franz; and Rehm, Josef, 4,577,171, Cl. 334-1.000.

Reichwein, Roy H.: *See*—
Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., 4,576,286, Cl. 209-558.000.

Reiff, Helmut: *See*—
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., 4,576,771, Cl. 264-109.000.

Reilly, Laurence W., Jr., to Minnesota Mining and Manufacturing Company. Water soluble Michler's ketone analogs in combined photoinitiator composition and polymerizable composition. 4,576,975, Cl. 522-13.000.

Reinhardt, Wilhelm; and Lipp, Helmut, to EBM Elektrobau Mulfingen GmbH & Co. Commutatorless D.C. motor with three-strand full-pitched stator winding. 4,577,139, Cl. 318-254.000.

Reinhold, Arnold G.: *See*—
Warren, Theodore L.; Whelan, Kenneth R.; and Reinhold, Arnold G., 4,577,344, Cl. 382-1.000.

Reischl, Artur; and Mack, Kurt, to Bayer Aktiengesellschaft. Use of water-absorbing, highly-filled polyurethane (urea) compositions for biological treatment of waste-containing liquids. 4,576,718, Cl. 210-616.000.

Reisman, Arnold, to Microelectronics Center of North Carolina. Method and apparatus for exposing photoresist by using an electron beam and controlling its voltage and charge. 4,576,884, Cl. 430-30.000.

Remsburger, Louis J.: *See*—
Barr, Millard G.; Barrett, William H.; Braidt, Joseph W.; Driscoll, John F.; Gregory, Joseph A.; Lucente, Samuel A.; and Remsburger, Louis J., 4,577,187, Cl. 340-700.000.

Rendek, Robert B.: *See*—
Tracy, Catherine O.; Binkerd, Evan F.; Rendek, Robert B.; and Wrobel, Raymond J., 4,576,825, Cl. 426-266.000.

Renevot, Gerard, to Regie Nationale des Usines Renault. Apparatus comprising the combination of filter apparatus and regeneration apparatus and process for regenerating the filter apparatus using the regeneration apparatus. 4,576,617, Cl. 55-96.000.

Rentsch, Edward M.; and Freedman, Larry A., to RCA Corporation. Apparatus for sensing transient phenomena in radiant energy images. 4,577,115, Cl. 250-578.000.

Renzo, Bernard: *See*—
Gallas, Gerard; Raher, Loic; and Renzo, Bernard, 4,576,366, Cl. 267-8.00R.

Reppert, Rudi; Zaunberger, Franz X.; and Kugler, Artur, to Zahnradfabrik Renk, A.G. High efficiency gear transmission. 4,576,062, Cl. 74-740.000.

Republic Steel Corporation: *See*—
Adams, James; and Belin, Felix, 4,576,570, Cl. 431-12.000.

Reschly, David C., to Detroit Stoker Company. Stoker. 4,576,101, Cl. 110-182.500.

Research Foundation of State University of New York, The: *See*—
Ehrlich, Paul; Anderson, Wayne A.; Kang, En T.; and Bhatt, Ansuya P., 4,576,887, Cl. 430-71.000.

Resener, Kenneth L., to Resener Machine & Tool Co., Inc. Quick disconnect arbor and die head for tube stock sizing apparatus. 4,576,031, Cl. 72-355.000.

Resener Machine & Tool Co., Inc.: *See*—
Resener, Kenneth L., 4,576,031, Cl. 72-355.000.

Retallick, William B., to Camet, Inc. Catalytic converter for an automobile. 4,576,800, Cl. 422-180.000.

Rey, Maria A.: *See*—
Takahashi, Yoshihiro; and Rey, Maria A., 4,577,338, Cl. 378-048.000.

Reynolds Metals Company: *See*—
Jarrett, Steve A.; and Krzyston, John F., 4,576,289, Cl. 209-631.000.

Rhone-Poulenc Specialities Chimiques: *See*—
Gauthier-Lafaye, Jean; and Perron, Robert, 4,576,809, Cl. 423-418.000.

Richard, Gary R.: *See*—
Conover, Gilbert, Jr.; and Richard, Gary R., 4,576,487, Cl. 374-183.000.

Richardson, Barry A.: *See*—
Dixon, Derek; and Richardson, Barry A., 4,576,038, Cl. 73-40.700.

Richeson, W. George. Knife with locking shroud. 4,576,164, Cl. 128-305.000.

Ricoh Company, Ltd.: *See*—
Kawamura, Atsushi, 4,576,444, Cl. 350-428.000.
Saito, Kinzi, 4,576,468, Cl. 355-15.000.
Sakamoto, Koji; and Kobayashi, Kazuo, 4,576,463, Cl. 355-3.0DD.

Ricoh Electronics, Inc.: *See*—
Shibata, Tomoo; and Jurdi, Wissam J., 4,577,204, Cl. 346-200.000.
Shibata, Tomoo; and Jurdi, Wissam J., 4,577,205, Cl. 346-204.000.

Rieck, James N., to Mobay Chemical Corporation. Conversion of incompatible mixed polyols to polyol products with increased resistance to phase separation. 4,576,731, Cl. 252-182.000.
Riederauer, Szilard: *See*—
Tamas, Istvan; Riederauer, Szilard; and Kovacs, Janos, 4,576,637, Cl. 75-10.00R.
Rieter Machine Works Limited: *See*—
Schwengeler, Peter, 4,576,342, Cl. 242-36.000.
Riggs, Dennis M.; and Redick, Hugh E., to Du Pont de Nemours, E. I., and Company. Process for adjusting the fiber structure of mesophase pitch fibers. 4,576,811, Cl. 423-447.200.
Rigler, Gunter; and Vollmer, Friedrich, to Voest-Alpine Aktiengesellschaft; and Friedrich Vollmer Fienmessgeratebau GmbH. Measuring arrangement, and a method, for measuring the gap formed between a first and a second roll or roller. 4,575,945, Cl. 33-182.000.
Riken Corporation: *See*—
Sugiuchi, Toshiyasu; Aoyama, Susumu; and Yoshida, Toshio, 4,575,913, Cl. 29-432.000.
Riley, Douglas H.: *See*—
Bimonte, Brian R.; Gauldin, Mark A.; and Riley, Douglas H., 4,577,066, Cl. 179-18.00B.
Rimma, John: *See*—
Crockatt, William B.; and Rimma, John, 4,576,987, Cl. 524-487.000.
Rinaldi, Michael. Turntable exercise machine. 4,576,372, Cl. 272-146.000.
Rines, Robert H.: *See*—
Lettvin, Jerome Y.; and Plotkin, George M., 4,577,160, Cl. 330-149.000.
Ritz, Josef: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,576,804, Cl. 423-265.000.
Rivett, Robert M.: *See*—
Needham, James C.; Rivett, Robert M.; and Perryman, Raymond A. G., 4,577,086, Cl. 219-117.100.
Rix, Albert; Martens, Horst; Drogi, Dieter; Frerichs, Klaus-Dieter; and Leschik, Wolfgang, to Olympia Werke AG. Cassette for the ink jet printer of an office machine. 4,577,200, Cl. 346-140.00R.
Rix Industries: *See*—
Slack, Don S., 4,576,381, Cl. 277-1.000.
Robberechts, Marcel: *See*—
Hageman, Jacques; Plumet, Lucien; and Robberechts, Marcel, 4,576,609, Cl. 8-103.000.
Robert Bosch GmbH: *See*—
Eschrich, Gerhard; Juhasz, Josef; and Schwab, Manfred, 4,577,143, Cl. 318-701.000.
Hafele, Walter; and Knorreck, Peter, 4,576,130, Cl. 123-372.000.
Leiber, Heinz, 4,576,419, Cl. 303-100.000.
Muller, Egbert; and Stumpe, Werner, 4,576,416, Cl. 303-15.000.
Roberts, Alan T.: *See*—
Mundt, Arnold L.; Beair, Charles E.; Naumann, Leo J.; Roberts, Alan T.; and LaPelle, Ronald J., 4,576,303, Cl. 220-89.00A.
Roberts, Donald K. Flotation trampoline. 4,576,375, Cl. 272-65.000.
Robertshaw Controls Company: *See*—
Lucas, William L.; Asbill, Clarence M., III; Frank, Gerald L.; and Miller, David M., 4,576,194, Cl. 137-84.000.
Robeson, Lloyd M.: *See*—
Hartsing, Tyler F.; Sauers, Marvin E.; and Robeson, Lloyd M., 4,576,842, Cl. 428-35.000.
Robinson, Frank, to Imperial Chemical Industries Limited. Process for the extraction of metal values and novel metal extractants. 4,576,815, Cl. 423-658.500.
Robinson, John W.: *See*—
Kaganowicz, Grzegorz; Robinson, John W.; and Thomas, John H., III, 4,576,829, Cl. 427-39.000.
Robinson, Joseph G.; and Foster, Pierce W., to Coal Industry (Patents) Limited. Polyimide product from phenanthrene. 4,577,009, Cl. 528-228.000.
Robinson, Michael; and Wilson, Harry B., to SCM Chemicals Limited. Process for beneficiating oxidic ores. 4,576,636, Cl. 75-1.00R.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Joining device. 4,576,506, Cl. 403-407.100.
Rogak, Michael; Golan, Leonard W.; Witbeck, Charles; and Golan, Stephen L., to Hawk Industries, Inc. Unitary bolt face and firing pin device. 4,575,962, Cl. 42-1.00Q.
Rogers Corporation: *See*—
Jodoin, Raymond C., 4,577,258, Cl. 361-321.000.
Rogers, Elmer H., Jr: *See*—
Fields, James R.; Rogers, Elmer H., Jr; and King, Larry K., 4,576,690, Cl. 204-67.000.
Rogers, Gwyn D.: *See*—
O'Brien, Richard W.; and Rogers, Gwyn D., 4,575,909, Cl. 26-18.600.
Rogers, Phil H.: *See*—
Ballew, James D.; and Rogers, Phil H., 4,577,272, Cl. 364-200.000.
Rogier, Leonce, to SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile. Wheel hub with built-in brake. 4,576,256, Cl. 188-71.600.
Rogler, Wolfgang: *See*—
Markert, Helmut; Rogler, Wolfgang; Bendel, Wolfgang; and Alber, Friedrich, 4,576,768, Cl. 264-27.000.
Rohm GmbH: *See*—
Baumgartner, Ehrenfried; Besecke, Siegmund; and Gaenzler, Wolfgang, 4,576,971, Cl. 521-108.000.
Liebler, Ralf; Besecke, Siegmund; and Munzer, Manfred, 4,576,870, Cl. 428-515.000.
Rohm GmbH Chemische Fabrik: *See*—
Krautter, Jurgen; and Dzialas, Willi, 4,576,864, Cl. 428-328.000.
Rohto Pharmaceutical Co., Ltd.: *See*—
Yoshida, Akiyoshi; Kametaka, Shigeru; and Hayashi, Shin'ichi, 4,576,914, Cl. 435-42.000.
Rolls-Royce Limited: *See*—
Mavrocostas, George, 4,576,002, Cl. 60-262.000.
Smith, Stanley, 4,576,001, Cl. 60-39.080.
Roper, Ralph E., to Wallace Expanding Machines, Inc. Stretch form die. 4,576,030, Cl. 72-296.000.
Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Benzofuran sulfamates. 4,576,632, Cl. 71-93.000.
Rosbotham, Ian D.: *See*—
Carroll, William G.; and Rosbotham, Ian D., 4,576,974, Cl. 521-173.000.
Roseland, Hermann; and Bark, Manfred, to Kloeckner Ferromatik Desma GmbH. Apparatus for lasting shoe uppers or shoes onto shoe lasts. 4,575,889, Cl. 12-15.000.
Rosen, Murray; and Lane, Thomas, to Marine Shield Corp. Anti-fouling coating composition, process for applying same and coating thereby obtained. 4,576,838, Cl. 427-385.500.
Rosensweig, Burton J.: *See*—
Bingham, George H.; Krupotich, Edward A.; and Rosensweig, Burton J., 4,576,287, Cl. 209-601.000.
Ross, Barry C.; and Johnson, Graham, to Hoechst AG. Penem derivatives. 4,576,939, Cl. 514-210.000.
Ross, Gerald W., to Ross, Norman R., a part interest. Device for cleaning electrical connectors. 4,575,892, Cl. 15-106.000.
Ross, Norman R.: *See*—
Ross, Gerald W., 4,575,892, Cl. 15-106.000.
Ross, Richard J.; and Speller, David J., to Baker Oil Tools, Inc. Unloading injection control valve. 4,576,196, Cl. 137-508.000.
Rothaut, Josef; Hausselt, Jurgen; Steinke, Rudi; and Klaus, Angela, to Degussa Aktiengesellschaft. Low gold dental alloys. 4,576,790, Cl. 420-464.000.
Rotta Research Laboratorium S.p.A.: *See*—
Rovati, Luigi; Makovec, Francesco; Senin, Paolo; and Casula, Pierluigi, 4,576,951, Cl. 514-282.000.
Roux, Michel: *See*—
Moufflet, Luc; Roux, Michel; and Valadier, Jean, 4,576,571, Cl. 432-9.000.
Rovati, Luigi; Makovec, Francesco; Senin, Paolo; and Casula, Pierluigi, to Rotta Research Laboratorium S.p.A. Proglumide, pharmaceutical preparations and compositions including it for use in human pain relief. 4,576,951, Cl. 514-282.000.
Rowe, Raymond G., to General Electric Company. Oxysulfide dispersion strengthened titanium compositions. 4,576,660, Cl. 148-407.000.
Rozek, Roy J., to Kohler Co. Perpendicular toilet trip lever assembly. 4,575,881, Cl. 4-405.000.
Rozenwaig, Boris: *See*—
Duquesne , Jean F.; and Rozenwaig, Boris, 4,577,311, Cl. 370-60.000.
Rozier, Henry. Broom with fixing device for holding bundles of plastic branches. 4,575,893, Cl. 15-171.000.
Rudnick, Leslie R., to Mobil Oil Corporation. Alkylation of durene utilizing high boiling condensed polyaromatic compounds. 4,577,049, Cl. 585-486.000.
Ruehenbeck, Wolfgang, to BASF Aktiengesellschaft. Heating a fixed-bed charge in a tube reactor, and an arrangement for carrying out the method. 4,576,573, Cl. 432-15.000.
Ruger, Roderich, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Aiming or sighting apparatus with synchronously rotating thermal imager and aiming head. 4,576,432, Cl. 350-1.200.
Ruger, Roderich, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Sighting mirror including a stabilizing device. 4,576,449, Cl. 350-500.000.
Ruger, William B.; and Melcher, Roy L., to Sturm, Ruger & Company, Inc. Pistol mechanism for blocking firing pin. 4,575,963, Cl. 42-70.00F.
Ruhrchemie Aktiengesellschaft: *See*—
Kalbfell, Heinz; Lieder, Bernhard; and Mercamp, Herbert, 4,577,043, Cl. 568-454.000.
Rullier, Pierre, to Salomon S.A. Adjustment display for ski binding. 4,576,397, Cl. 280-625.000.
Rummler, Jurgen, to Deutsches Elektronen-Synchrotron Desy. Driving circuit for pulse current power supplies. 4,577,118, Cl. 307-106.000.
Rutherford, Harry: *See*—
White, Cathleen A.; Senne, Richard K.; and Rutherford, Harry, 4,576,399, Cl. 282-8.00R.
Ruzicka, Alan V.: *See*—
Benson, Alan M.; Mawer, John D.; and Ruzicka, Alan V., 4,576,386, Cl. 277-165.000.
Ryan, John O., to Macrovision. Method and apparatus for modifying the color burst to prohibit videotape recording. 4,577,216, Cl. 358-19.000.
Rylatt, John A.: *See*—
Granata, Samuel J., Jr.; and Rylatt, John A., 4,576,222, Cl. 165-76.000.
S.A.I.A.G. S.p.A.: *See*—
Azzola, Roberto; and Carrera, Luciano, 4,576,773, Cl. 264-167.000.
S & B Engineers: *See*—
Slaughter, William B.; and Haynie, Henry C., Sr., 4,576,235, Cl. 166-374.000.

S.O.M., S.p.A.: *See*—
Lupo, Giorgio; Capra, Pier C.; and Marcarino, Aldo, 4,576,264, Cl. 192-48.910.
Saari, Oliver, to Illinois Tool Works Inc. Anti-friction nut/screw drive. 4,576,057, Cl. 74-424.80C.
Sacco, Decio: *See*—
Armida, Gennaro; Sacco, Decio; and Grilli, Walter, 4,575,914, Cl. 29-434.000.
Sace S.p.A. Costruzioni Elettromeccaniche: *See*—
Talpo, Gianpietro, 4,577,073, Cl. 200-148.00A.
Sachs, Hanns I.: *See*—
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., 4,576,771, Cl. 264-109.000.
Saenger, Dietrich; and Barzynski, Helmut. Process of making and using a positive working photosensitive film resist material. 4,576,902, Cl. 430-326.000.
Safer Agro-Chem Ltd.: *See*—
Puritch, George S.; and Kondo, Edward S., 4,576,950, Cl. 514-358.000.
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Hall, Henry B.; Hewes, Peter B.; Moore, Benjamin N.; and Sanzaro, Rosario, 4,576,798, Cl. 422-105.000.
Saiki, Eisaku; Kawamura, Satoshi; and Kawauchi, Masataka, to Hitachi, Ltd. Thermal transfer recording apparatus. 4,577,199, Cl. 346-76.0PH.
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, to Nippon Kogaku K.K. System for driving a movable stage. 4,577,141, Cl. 318-590.000.
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Spieldiener, Robert; Saiko, Alfons; and Spieldiener, Reinhold, 4,576,373, Cl. 272-41.000.
Saint-Marc, Henri R.: *See*—
Derain, Christian; and Saint-Marc, Henri R., 4,576,540, Cl. 414-511.000.
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Andersen, Frieda, 4,577,185, Cl. 340-573.000.
Saito, Kinzi, to Ricoh Company, Ltd. Cleaning apparatus of electrophotographic copying machine. 4,576,468, Cl. 355-15.000.
Saito, Miyuki: *See*—
Uehara, Akira; Uehara, Takashi; Saito, Miyuki; and Ishida, Toshiyuki, 4,577,165, Cl. 331-109.000.
Saito, Syuichiro: *See*—
Okino, Tadashi; and Saito, Syuichiro, 4,576,456, Cl. 352-216.000.
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Cho, Michio; Suzuki, Masane; and Saito, Takayuki, 4,576,458, Cl. 354-199.000.
Saito, Yukio: *See*—
Shimaoka, Motohiro; and Saito, Yukio, 4,577,247, Cl. 360-97.000.
Saitoh, Mikio: *See*—
Kuriyama, Shizuo; and Saitoh, Mikio, 4,576,966, Cl. 514-648.000.
Saitoh, Shinichi: *See*—
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.
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Nemoto, Shigeru; Kitajima, Goro; Saitou, Sinichi; and Osada, Hazime, 4,577,245, Cl. 360-93.000.
Saji, Keiichi: *See*—
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, 4,576,705, Cl. 204-406.000.
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Akita, Kenji; Sakaguchi, Minoru; and Suzuyama, Hiroshi, 4,577,075, Cl. 200-148.00R.
Sakaguchi, Yoichi: *See*—
Morinaga, Akio; Sakaguchi, Yoichi; Hyodo, Masakatsu; and Yagi, Isaburo, 4,576,205, Cl. 138-98.000.
Sakai, Minoru: *See*—
Takahashi, Osamu; and Sakai, Minoru, 4,576,906, Cl. 430-497.000.
Sakakibara, Tatsuo: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,576,863, Cl. 428-325.000.
Sakakiyama, Ryuzo: *See*—
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Sakamoto, Koji; and Kobayashi, Kazuo, to Ricoh Company, Ltd. Developing apparatus for electrostatic photography. 4,576,463, Cl. 355-3.0DD.
Sakamoto, Masaharu: *See*—
Yoshikawa, Shoji; and Sakamoto, Masaharu, 4,577,320, Cl. 372-29.000.
Sakamoto, Shuichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.
Sakata, Hiromi; Kozuka, Nobuhiko; and Hiraoka, Hiroshi, to Mita Industrial Co., Ltd. Charge eliminating lamp device. 4,576,464, Cl. 355-3.00R.
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, to Daikin Kogyo Co., Ltd. Polymeric dielectric material. 4,577,005, Cl. 526-254.000.
Sakoda, Ryozo: *See*—
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,576,934, Cl. 514-85.000.
Sakuraya, Takashi: *See*—
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.
Salibello, Cosmo: *See*—
Charney, Gregory S.; Hohner, Terrance D.; and Salibello, Cosmo, 4,576,454, Cl. 351-243.000.
Salomon S.A.: *See*—
Petrini, Roland, 4,575,957, Cl. 36-121.000.
Rullier, Pierre, 4,576,397, Cl. 280-625.000.
Salowe, Seymour, to Westinghouse Electric Corp. Method and apparatus for providing offset compensation. 4,577,279, Cl. 364-483.000.
Samblebe, Reinhard: *See*—
Norden, Jurgen; Aigner, Heinrich; Schindler, Fritz; and Samblebe, Reinhard, 4,576,625, Cl. 71-3.000.
Sammler, Louis S.: *See*—
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Sanders, Mark E. Hexaalkylmelamine-amino-oxy compounds. 4,576,945, Cl. 514-245.000.
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Laszlo, Fiak; Sandor, Derzsenyi; and Sandor, Darin, 4,576,422, Cl. 308-6.00C.
Sandor, Derzsenyi: *See*—
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Sano, Yoshiaki; Omura, Isamu; and Hiramatsu, Ryo, to Fujitsu Limited. Differential circuit. 4,577,121, Cl. 307-355.000.
Sanofi: *See*—
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,576,946, Cl. 514-247.000.
Santos, Llandro C.: *See*—
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Santrade Ltd.: *See*—
Muren, Sture, 4,575,888, Cl. 10-101.00R.
Olsson, Olle G.; Yaman, Melih; Waldenstrom, Mats G.; and Fischer, Udo K. R., 4,576,875, Cl. 428-627.000.
Sanyo Chemical Industries, Ltd.: *See*—
Okina, Toyohiko; Goto, Hiroshi; Ozawa, Akimasa; Nakamura, Kenji; and Oishi, Hiroshi, 4,576,855, Cl. 428-215.000.
Sanzaro, Rosario: *See*—
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Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,577,044, Cl. 568-677.000.
Saruhashi, Masakuni: *See*—
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Sasa, Hiroyuki: *See*—
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Sasaki Electric Manufacturing Co., Ltd.: *See*—
Hitora, Shozo, 4,577,178, Cl. 340-81.00R.
Sasaki, Ichitaro; Mori, Takashi; and Tsuyuguchi, Tadao, to Teijin Limited. Polyester film roll. 4,576,344, Cl. 242-67.10R.
Sasaki, Manji: *See*—
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, 4,576,734, Cl. 252-404.000.
Sasaki, Osamu: *See*—
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Satake, Keigo: *See*—
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Sato, Kazuhiro; and Oguri, Katsuhiko, to Victor Company of Japan, Limited. Hall effect magnetic head. 4,577,250, Cl. 360-112.000.
Sato, Masanori: *See*—
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.
Sato, Noboru; and Tanaka, Tomiji, to Sony Corporation. Magneto-optical recording medium and method of making same. 4,576,699, Cl. 204-192.00M.
Sato, Shinichi: *See*—
Arai, Masatoshi; Futatsumori, Koji; Inoue, Takeo; and Sato, Shinichi, 4,577,041, Cl. 556-446.000.
Sato, Yoshio: *See*—
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Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.
Satoh, Susumu; Obara, Takashi; and Nishida, Minoru, to Kawasaki Steel Corporation. Method of producing cold rolled steel sheets for deep drawing. 4,576,656, Cl. 148-12.00C.
Satoh, Susumu; Hashimoto, Osamu; and Irie, Toshio, to Kawasaki Steel Corporation. Process of manufacturing a cold rolled steel sheet having excellent press formability. 4,576,657, Cl. 148-12.00C.

Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, 4,576,725, Cl. 252-62.510.
Saud, Abel: *See*—
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Sauers, Marvin E.: *See*—
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Saulson, Stanley H.: *See*—
Hooven, Michael D.; and Saulson, Stanley H., 4,576,035, Cl. 73-4.00R.
Saunders, William T., to Weirton Steel Corporation. Sheet metal wall panel and integral opener structure. 4,576,305, Cl. 220-269.000.
Sauter, Hubert: *See*—
Parg, Adolf; Hamprecht, Gerhard; Sauter, Hubert; and Wuerzer, Bruno, 4,576,630, Cl. 71-92.000.
Sawanaka, Hiroshi: *See*—
Kiuchi, Eiichi; Sawanaka, Hiroshi; and Tomita, Yuichi, 4,577,193, Cl. 343-380.000.
Schabron, John F., to Phillips Petroleum Company. Method for analysis of additives in polyolefins. 4,576,917, Cl. 436-85.000.
Schade, Reinhart, to Siemens Aktiengesellschaft. Method for making contact with the electrode on the adhesive-coated side of an electrical component and the article made by such method. 4,576,670, Cl. 156-219.000.
Schaefer, Roland, to Kulzer & Co., GmbH. Process for the photopolymerization of vinyl compounds and photopolymerizable materials. 4,576,976, Cl. 522-16.000.
Schaefle , Henri: *See*—
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Schaller, Heinrich: *See*—
Fryberg, Mario; Schaller, Heinrich; Steiger, Rolf; and Peter, Heinz, 4,576,885, Cl. 430-390.000.
Schantz, Robert E. Gas horseshoe forge. 4,576,574, Cl. 432-120.000.
Schaper, Leonard W., to AT&T Bell Laboratories. Low-inductance power/ground distribution in a package for a semiconductor chip. 4,577,214, Cl. 357-74.000.
Scharfenbergkupplung GmbH: *See*—
Forster, Hilmar, 4,576,294, Cl. 213-9.000.
Scharting, Gunter; and Neugebauer, Steffen, to FAG Kugelfischer Georg Schafer (KGaA). Protective cap for the sealing of a bushing around a pin in a cardan joint. 4,576,382, Cl. 277-12.000.
Schedele, Helmut; and Schweiger, Josef, to Siemens Aktiengesellschaft. Electromagnetic relay and method for the manufacture thereof. 4,577,172, Cl. 335-80.000.
Schedele, Helmut; Schweiger, Josef; and Stadler, Heinz, to Siemens Aktiengesellschaft. Electromagnetic relay and method for manufacturing such relay. 4,577,173, Cl. 335-80.000.
Schenk, Joerg: *See*—
Schwanitz, Manfred; Gaertner, Dietrich; Dressler, Wolfgang; and Schenk, Joerg, 4,577,195, Cl. 343-702.000.
Schepp, Frank, to Inline Plastics Corporation. Food tray with lockable lid. 4,576,330, Cl. 229-44.00R.
Schering AG: *See*—
Goffredo, Daniel L.; Meyer, Walter J.; and Blaising, Horst, 4,576,685, Cl. 204-30.000.
Scheuter, Siegbert; and Kuhn, Friedrich, to J. M. Voith GmbH. Double supporting roller winding machine. 4,576,343, Cl. 242-66.000.
Schiel, Christian, to J. M. Voith GmbH. Machine for making a fiber web with sharply defined edges. 4,576,681, Cl. 162-301.000.
Schiff, Leonard N., to RCA Corporation. Synchronization system for a regenerative subtransponder satellite communication system. 4,577,316, Cl. 370-104.000.
Schiff, Peter. Percutaneous intra-aortic balloon and method for using same. 4,576,142, Cl. 128-1.00D.
Schilling, Hugh K.; Dayen, Leonid; and Raines, Charles D., to Horton Manufacturing Co., Inc. Rotational control apparatus. 4,576,266, Cl. 192-70.120.
Schindele, Alfred, to Terrot Strickmaschinen GmbH. Stitch-forming machine. 4,576,019, Cl. 66-106.000.
Schindler, Fritz: *See*—
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Schlenz, Dieter: *See*—
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Schlingmann, Merten: *See*—
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Schlosser, Erich J., to Weber-Stephen Products Co. Ash catcher for charcoal grill. 4,576,140, Cl. 126-25.00R.
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Sherman, Harold; and Ullo, John J., 4,577,102, Cl. 250-269.000.
Upchurch, James M., 4,576,234, Cl. 166-319.000.
Schmid, Gerard: *See*—
Hubschwerlen, Christian N.; and Schmid, Gerard, 4,576,751, Cl. 260-245.400.
Schmidt, Alfred; and Flachenecker, Gerhard, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Apparatus for guiding a trackless vehicle. 4,577,140, Cl. 318-587.000.
Schmidt, Howard W., Jr.: *See*—
Gallagher, James P.; and Schmidt, Howard W., Jr., 4,576,698, Cl. 204-192.00E.
Scholl, Hans-Joachim; Reiff, Helmut; and Sachs, Hanns I., to Bayer Aktiengesellschaft. Aqueous isocyanate emulsions and their use as binders in a process for the production of shaped articles. 4,576,771, Cl. 264-109.000.
Scholler, Peter: *See*—
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Scholten, Pieter C.; and Eijnthoven, Ronald K., to U.S. Philips Corporation. Method of forming a luminescent layer on a carrier and low-pressure mercury vapor discharge lamp having a layer applied to a carrier by means of such a method. 4,576,833, Cl. 427-67.000.
Schoof, Wendy M.: *See*—
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Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,576,741, Cl. 252-522.00R.
Schrepfer, Rudolf. Leveling element. 4,576,357, Cl. 248-662.000.
Schreuder, Jan, to Plessey South Africa Limited. Phase measuring method and apparatus. 4,577,150, Cl. 324-83.00R.
Schultes, Tilmann; and Seidel, Joachim, to Kortenback & Rauh KG. Umbrella frame. 4,576,191, Cl. 135-30.000.
Schultz, Frederick E., to General Electric Co. Method of manufacturing a turbomachinery rotor. 4,576,770, Cl. 264-103.000.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, to BASF Aktiengesellschaft. Heat-curable surface-coating agents, and their use. 4,576,979, Cl. 523-404.000.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., to Eaton Corporation. AC Solar cell. 4,577,052, Cl. 136-246.000.
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., to Eaton Corporation. Bidirectional power FET with integral avalanche protection. 4,577,208, Cl. 357-23.400.
Schwab, Manfred: *See*—
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Schwanitz, Manfred; Gaertner, Dietrich; Dressler, Wolfgang; and Schenk, Joerg, to International Standard Electric Corporation. Miniaturized mobile radio receiver with dipole antenna. 4,577,195, Cl. 343-702.000.
Schwartz, Eugene B.: *See*—
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Schwarz, Gerd-Ulrich; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Dihalovinylphenyl phosphates and their use as pesticides. 4,576,935, Cl. 514-113.000.
Schwarz, Helmut; and Stickel, Heinz, to Siemens Aktiengesellschaft. Device for guiding a print element. 4,576,496, Cl. 400-352.000.
Schweiger, Josef: *See*—
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Schedele, Helmut; Schweiger, Josef; and Stadler, Heinz, 4,577,173, Cl. 335-80.000.
Schwengeler, Peter, to Rieter Machine Works Limited. Apparatus for lifting a wound yarn package. 4,576,342, Cl. 242-36.000.
Schwieker, Horst H.; and Gieschen, Kurt, to U.S. Philips Corporation. Diaphragm arrangement for X-ray spot-film device. 4,577,341, Cl. 378-150.000.
Schwindt, Jurgen: *See*—
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Owens, Phillip M., 4,576,695, Cl. 204-181.400.
Scott, Thomas: *See*—
McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.
Scuro, Samuel J., to Westinghouse Electric Corp. Linear fiber armature for electromagnetic launchers. 4,576,082, Cl. 89-8.000.
Seberger, Oswald P., Jr. Device for silencing firearms. 4,576,083, Cl. 89-14.400.
Seidel, Francis L.: *See*—
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Seidel, Hans-Georg, to Hermann Heye. Machine for forming hollow articles of vitreous material. 4,576,624, Cl. 65-300.000.
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Sekiya, Toshiyuki: *See*—
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Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, to Nissan Chemical Industries Ltd. Antihypertensive dihydropyridine-5-phosphonic acid cyclic esters. 4,576,934, Cl. 514-85.000.
Sewhuk, David W.: *See*—
Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., 4,577,197, Cl. 346-75.000.
Sexton, Robert W.: *See*—
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Shannon, Robert A., to North American Manufacturing Company. Method and system for controlling a selected zone in a fuel fired furnace. 4,577,278, Cl. 364-477.000.
Sharp, Charles M., to SWS Inc. Method of laser butt welding. 4,577,088, Cl. 219-121.0LD.
Sharp Kabushiki Kaisha: *See*—
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Shaughnessy, McKevin. Means for creating random patterns of variegated light, and light-reflective means therefor. 4,576,433, Cl. 350-4.100.
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Shaw, Daniel, to General Motors Corporation. Stationary continuous automatic pouring process. 4,576,217, Cl. 164-130.000.
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Shepherd, Charles E.: *See*—
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Shepherd, G. Maury; and Shepherd, Charles E., to C. E. Shepherd Company. Fill slat assembly for cooling towers. 4,576,764, Cl. 261-111.000.
Shepherd, Robin G.: *See*—
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Sherman, Harold; and Ullo, John J., to Schlumberger Technology Corporation. Method and apparatus for distinguishing hydrocarbon from fresh water in situ. 4,577,102, Cl. 250-269.000.
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Shetty, Bola V., to Euroceltique, S.A. Iodophor composition. 4,576,818, Cl. 424-150.000.
Shibata, Hiroshi, to VLSI Technology Research Association. Pattern forming method. 4,576,678, Cl. 156-643.000.
Shibata, Hiroshi: *See*—
Mazaki, Shiro; and Shibata, Hiroshi, 4,576,990, Cl. 524-602.000.
Shibata, Tomoo; and Jurdi, Wissam J., to Ricoh Electronics, Inc. Thermosensitive recording label. 4,577,204, Cl. 346-200.000.
Shibata, Tomoo; and Jurdi, Wissam J., to Ricoh Electronics, Inc. Releasable heat-sensitive label with E. B. setting printing ink. 4,577,205, Cl. 346-204.000.
Shida, Takafumi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kanda, Yoichi; Satake, Keigo; Shinkawa, Hiroyasu; and Yamazaki, Shiro, 4,577,029, Cl. 548-162.000.
Shields, Charles E. Method and apparatus for applying a connector having an injection molded cover to multiconductor cable. 4,575,935, Cl. 29-858.000.
Shields, D. Leet. Cast metal breaker apparatus. 4,576,380, Cl. 225-104.000.
Shiga, Koji; and Arito, Tatsunari, to Fuji Photo Film Co., Ltd.; and Fuji Micro Graphics Co., Ltd. Sensitive material cutting and transporting mechanism. 4,576,469, Cl. 355-29.000.
Shiiba, Suenobu: *See*—
Kozai, Shinji; Shiiba, Suenobu; and Higashitani, Yoshitaka, 4,575,970, Cl. 51-165.920.
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, to Hitachi, Ltd; and Hitachi Maxell, Ltd. Magnetic recording medium. 4,576,876, Cl. 428-679.000.
Shimamura, Tadaaki: *See*—
Naitoh, Katsumi; and Shimamura, Tadaaki, 4,575,916, Cl. 29-517.000.
Shimanaka, Hirotaka. Method of manufacturing alate medical needle. 4,576,671, Cl. 156-245.000.
Shimano, Akira: *See*—
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,576,341, Cl. 242-35.50A.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,576,587, Cl. 474-152.000.
Shimaoka, Motohiro; and Saito, Yukio, to Alps Electric Co., Ltd. Recording and reproducing apparatus with cartridge retaining means. 4,577,247, Cl. 360-97.000.
Shimazaki, Kenji, to Toho Beslon Co., Ltd. Active carbon fibers as adsorbent for water purification. 4,576,929, Cl. 502-417.000.
Shimizu Pharmaceutical Co., Ltd.: *See*—
Sugiyama, Tohru; Suzuki, Yasuo; Katagiri, Katsumasa; and Furutani, Satoshi, 4,576,930, Cl. 514-23.000.
Shimizu, Yoshiki: *See*—
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.
Shimotaka, Hisakuni: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,576,588, Cl. 493-475.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; Futatsumori, Koji; Inoue, Takeo; and Sato, Shinichi, 4,577,041, Cl. 556-446.000.
Shinkawa, Hiroyasu: *See*—
Aoki, Katsumichi; Shida, Takafumi; Kanda, Yoichi; Satake, Keigo; Shinkawa, Hiroyasu; and Yamazaki, Shiro, 4,577,029, Cl. 548-162.000.
Shinohara, Shigeyuki: *See*—
Makino, Hiroshi; and Shinohara, Shigeyuki, 4,576,099, Cl. 104-287.000.
Shionogi & Co., Ltd.: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, 4,576,956, Cl. 514-380.000.
Miyazaki, Hiroshi; and Ikeda, Masato, 4,576,174, Cl. 128-639.000.
Totani, Tetsushi; and Aono, Katsutoshi, 4,577,038, Cl. 556-137.000.
Shionoya, Masahisa: *See*—
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, 4,576,734, Cl. 252-404.000.
Shiraishi, Atsushi; and Nishimura, Mizuho, to Fuji Photo Film Co., Ltd. Information input/output apparatus for disk film. 4,576,474, Cl. 355-75.000.
Shiroishi, Yoshihiro: *See*—
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, 4,576,876, Cl. 428-679.000.
Shoko Kiko Co., Ltd.: *See*—
Takami, Masaho, 4,575,994, Cl. 53-582.000.
Shukla, Jayendra G.; Sohn, Ki G.; Twickler, Carl; and de Pierne, Otto S., to Ferro Corporation. Fixed ophthalmic lens polishing pad. 4,576,612, Cl. 51-295.000.
Shuler, George C. Apparatus and method for straightening warped doors. 4,575,980, Cl. 52-291.000.
Shulman, Yuri. Holder for inconspicuously mounting a microphone. 4,577,070, Cl. 179-146.00R.
Siemens Aktiengesellschaft: *See*—
Bentele, Benedikt; and Heerlein, Manfred, 4,576,489, Cl. 384-469.000.
Diepers, Heinrich; Feigt, Ingmar; and Lange, Gottfried, 4,577,108, Cl. 250-370.000.
Erhardt, Werner; and Hieber, Udo, 4,577,257, Cl. 361-272.000.
Frosien, Jurgen; and Pomper, Michael, 4,577,147, Cl. 324-71.300.
Kriedt, Hans; and Fenk, Josef, 4,577,336, Cl. 377-111.000.
Markert, Helmut; Rogler, Wolfgang; Bendel, Wolfgang; and Alber, Friedrich, 4,576,768, Cl. 264-27.000.
Oestreich, Ulrich, 4,576,871, Cl. 428-521.000.
Schade, Reinhart, 4,576,670, Cl. 156-219.000.
Schedele, Helmut; and Schweiger, Josef, 4,577,172, Cl. 335-80.000.
Schedele, Helmut; Schweiger, Josef; and Stadler, Heinz, 4,577,173, Cl. 335-80.000.
Schwarz, Helmut; and Stickel, Heinz, 4,576,496, Cl. 400-352.000.
Siemens Gammasonics, Inc.: *See*—
Meeder, Raymond L., 4,577,107, Cl. 250-363.00S.
Silcock, Terence M. B.; and Timms, Colin T., to Lucas Industries Public Limited Company. Liquid fuel injection pumping apparatus. 4,576,133, Cl. 123-458.000.
Silcox, William H.: *See*—
Suh, Sung L.; Burns, Gerald E.; and Silcox, William H., 4,576,520, Cl. 405-224.000.
Silverberg, Morton, to Xerox Corporation. Sheet hinge forming apparatus. 4,576,461, Cl. 355-3.00R.

Silvestri, George J., Jr., to Westinghouse Electric Corp. Turbine protection system for bypass operation. 4,576,008, Cl. 60-662.000.

Simonson, John L.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,577,027, Cl. 546-345.000.

Sindlinger, Raimund: *See*—
Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, 4,576,903, Cl. 430-331.000.

Siskin, Michael; and Brons, Glen B., to Exxon Research and Engineering Co. Process for beneficiating coal. 4,576,707, Cl. 208-8.0LE.

Skantz, Kaj M.; and Christiansen, Ari R. E., to Shell Internationale Research Maatschappij B.V. Rust preventive and process for the preparation thereof. 4,576,643, Cl. 106-14.240.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Walter, Lothar; Haas, Roland; and Dobhan, Herbert, 4,576,268, Cl. 192-98.000.

Skiles, Richard D.: *See*—
Pilgram, Kurt H.; and Skiles, Richard D., 4,577,011, Cl. 534-787.000.

Skinner, Russell A., Sr.; and Ciciora, Walter S., to American Television & Communications Corporation. Power safety device for CATV tap-off unit. 4,577,221, Cl. 358-86.000.

Slack, Don S., to Rix Industries. Spiral piston ring with tapered ends and recesses. 4,576,381, Cl. 277-1.000.

Slaughter, William B.; and Haynie, Henry C., Sr., to S & B Engineers. Downhole relief valve. 4,576,235, Cl. 166-374.000.

Slomianny, Jan, to Domino Printing Sciences Plc. Marking jet discharging head. 4,576,111, Cl. 118-313.000.

Slusarchyk, William A.: *See*—
Zahler, Robert; Koster, William H.; and Slusarchyk, William A., 4,576,749, Cl. 260-239.00A.

Smallhorn, Edward A.; and Oliver, John B., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laminar flow element. 4,576,204, Cl. 138-44.000.

Smed, Jan P.; Seitzer, Kenneth E.; and Hultgren, Kent G., to Westinghouse Electric Corp. Self-aligning static seal for gas turbine stator vanes. 4,576,548, Cl. 415-137.000.

Smetak, Edward C., to Exxon Production Research Co. Pile release mechanism. 4,576,523, Cl. 405-227.000.

Smith, Dresden G. Air and water volume control apparatus for hydropneumatic tanks. 4,576,552, Cl. 417-2.000.

Smith, Henry E., to Xerox Corporation. Print wheel cartridge. 4,576,494, Cl. 400-175.000.

Smith, Henry I.; Atwater, Harry A.; and Geis, Michael W., to Massachusetts Institute of Technology. Thick crystalline films on foreign substrates. 4,576,676, Cl. 156-603.000.

Smith, Herman W., to Upjohn Company, The. Use of 5,6,7,8-tetrahydroquinolines and 5,6-dihydropyrindines as leukotriene and lipoxygenase inhibitors and the novel 3-substituted compounds therein. 4,576,949, Cl. 514-277.000.

Smith, James R. Pants closure. 4,575,873, Cl. 2-234.000.

Smith, Joseph E., to O & S Manufacturing Company. Ball and socket joints with wear indicator. 4,576,499, Cl. 403-27.000.

Smith, Kenneth C.: *See*—
Armond, John W.; and Smith, Kenneth C., 4,576,614, Cl. 55-18.000.

Smith Kline & French Laboratories Limited: *See*—
Manning, Graham P., 4,576,619, Cl. 55-213.000.

Smith, Lawrence E.: *See*—
Kohl, Paul A.; Smith, Lawrence E.; and Trop, Harvey S., 4,576,691, Cl. 204-129.300.

Smith, Malcolm S.; and Daigle, Colastie J., to Du Pont de Nemours, E. I., and Company. Long life semi-artificial bait. 4,576,821, Cl. 426-1.000.

Smith, Peter E.: *See*—
Laxton, Raymond; and Smith, Peter E., 4,577,220, Cl. 358-84.000.

Smith, Randel P.; and Steiner, Robert L., to Steiner Corporation. Fluid refill pouch and dispenser. 4,576,313, Cl. 222-81.000.

Smith, Stanley, to Rolls-Royce Limited. Gas turbine engine oil systems. 4,576,001, Cl. 60-39.080.

SmithKline Beckman Corporation: *See*—
Polansky, Theodore J., 4,576,937, Cl. 514-204.000.

Smolik, Robert A. Electrical receptacle box assembly. 4,576,302, Cl. 220-3.500.

Smyth, Laurence C.; and Deep, George, to Noranda Inc. Method and apparatus for maintaining an atmosphere around a predetermined portion of an endless discrete object conveyor. 4,576,220, Cl. 164-66.100.

Snider, Alan D.; Soporowski, Andrzej L.; and Herbst, Manfred O., to Esselte Pendaflex Corporation. Hanging partition folder. 4,576,328, Cl. 229-1.50R.

Snow, Bennie E.: *See*—
Martens, Alan; Wescott, Kermit R.; and Snow, Bennie E., 4,576,124, Cl. 122-406.0ST.

Snyder, James R.: *See*—
Park, David B.; Snyder, James R.; McDonald, Gerard J.; and Hoet, Roland, 4,576,277, Cl. 198-803.010.

Snyder, Richard N. Remote radio blasting. 4,576,093, Cl. 102-200.000.

Snyder, Robert H.; and Tolonen, Eric O., to Uniroyal, Inc. Scrap tire cutting apparatus. 4,576,339, Cl. 241-120.000.

SO.M.A. Europe Transmissions Societe Nouvelle Mecanique et Automobile: *See*—
Rogier, Leonce, 4,576,256, Cl. 188-71.600.

Sobczak, Zbigniew P., to NCR Corporation. Method for forming trench isolation structures. 4,576,834, Cl. 427-93.000.

Societe Alsacienne de Construction de Material Textile: *See*—
Gauvain, Roger, 4,575,903, Cl. 19-159.00R.

Societe Anonyme D.B.A.: *See*—
Carre, Jean J.; and Meynier, Guy, 4,576,257, Cl. 188-73.320.
Mery, Jean-Claude; Carre, Jean-Jacques; and Thioux, Alain, 4,576,255, Cl. 188-71.500.

Societe Nationale Industrielle Aerospatialle: *See*—
Jonca, Henri V. J., 4,575,931, Cl. 29-747.000.

Societe Nouvelle des Bennes Saphem: *See*—
Derain, Christian; and Saint-Marc, Henri R., 4,576,540, Cl. 414-511.000.

Socola, Helen M.; and Topor, Michael G., to Frito-Lay, Inc. Apparatus for applying viscous seasoning evenly to tumbling food articles. 4,576,108, Cl. 118-19.000.

Soder, Alfons: *See*—
Hinze, Heinz-Joachim; Soder, Alfons; and Popendiker, Kurt, 4,576,947, Cl. 514-263.000.

Soderberg, John H.; Jones, Howell A.; Eckert, Alton B.; and Duwel, Edward E., to Pitney Bowes Inc. Postage meter with keyboard keys for causing meter operations to be performed. 4,577,283, Cl. 364-454.000.

Sohn, Ki G.: *See*—
Shukla, Jayendra G.; Sohn, Ki G.; Twickler, Carl; and de Pierne, Otto S., 4,576,612, Cl. 51-295.000.

Solbern Corp.: *See*—
Eisenberg, Bernard C., 4,576,209, Cl. 141-1.000.

Solco Basel AG: *See*—
Oertli, Robert, 4,576,696, Cl. 204-182.600.

Solis s.r.l.: *See*—
Gazzarrini, Vinicio, 4,576,318, Cl. 223-52.000.

Sollami, Phillip A. Rotary tool holder. 4,576,528, Cl. 408-140.000.

Sollins, Irving V.: *See*—
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,576,591, Cl. 604-62.000.

Solms, Jurgen: *See*—
Bechem, Werner; Peters, Hubertus; Solms, Jurgen; and Wolfhard, Dietrich, 4,576,684, Cl. 204-28.000.

SOLVAY & Cie (Societe Anonyme): *See*—
Viehe, Heinz; Mesmaeker, Nadine S.; and Merenyi, Robert, 4,576,759, Cl. 260-410.90R.

Sony Corporation: *See*—
Collins, Mark C., 4,577,237, Cl. 358-336.000.
Fukuda, Shinichi, 4,577,180, Cl. 340-347.0DD.
Kambara, Goro; and Fujii, Makoto, 4,576,113, Cl. 118-697.000.
Katsuyama, Akira; and Kimura, Shuichi, 4,577,300, Cl. 369-43.000.
Sato, Noboru; and Tanaka, Tomiji, 4,576,699, Cl. 204-192.00M.
Takanashi, Kenji, 4,577,236, Cl. 358-320.000.
Wilkinson, James H., 4,577,241, Cl. 360-51.000.

Soobitsky, James A., to Zygo Corporation. Piezoelectric micromotion actuator. 4,577,131, Cl. 310-328.000.

Soporowski, Andrzej L.: *See*—
Snider, Alan D.; Soporowski, Andrzej L.; and Herbst, Manfred O., 4,576,328, Cl. 229-1.50R.

Sorbini, Paolo, to Also Laboratori S.A.S. Dietary supplement and method. 4,576,932, Cl. 514-54.000.

Sorenson, Gregg R.: *See*—
Olson, Gene R.; and Sorenson, Gregg R., 4,577,089, Cl. 219-124.220.

Sotnikov, Ivan A.: *See*—
Lipets, Adolf U.; Kuznetsova, Svetlana M.; Galuskin, Vadim B.; Lafa, Jury I.; Sotnikov, Ivan A.; Ovchar, Vladimir G.; and Fedosov, Alexei Z., 4,576,226, Cl. 165-134.100.

Sougen, Katsuya, to AIWA Co., Ltd. Video tape recorder usable with different types of tape cassettes. 4,577,239, Cl. 360-15.000.

Soulie, Jacques: *See*—
Plard, Christian; and Soulie, Jacques, 4,577,093, Cl. 219-376.000.

Southwest Research Institute: *See*—
Light, Glenn M., 4,577,337, Cl. 378-044.000.

Spanko, Jacob E. Measurement templates for a dental restoration. 4,576,576, Cl. 433-72.000.

Spartanics Ltd.: *See*—
Mohan, William L.; and Willits, Samuel P., 4,576,262, Cl. 192-18.00B.

Spector, George: *See*—
Farrelly, Susan E.; and Spector, George, 4,576,668, Cl. 156-93.000.
Huhn, John H.; and Spector, George, 4,575,978, Cl. 52-234.000.
Jamerson, Willis B.; and Spector, George, 4,575,884, Cl. 5-420.000.

Speed Cut, Inc.: *See*—
Pyle, Stoddard H., 4,576,076, Cl. 83-471.300.

Speller, David J.: *See*—
Ross, Richard J.; and Speller, David J., 4,576,196, Cl. 137-508.000.

Spellman, Stanley. Refuse bag frame for vacuum cleaners. 4,575,895, Cl. 15-327.00R.

Spencer, Michael L., to Marliss Industries, Inc. Folding outrigger attachment for farm implements. 4,576,238, Cl. 172-311.000.

Spencer, Terrance D.: *See*—
Johnson, Thomas E.; and Spencer, Terrance D., 4,576,406, Cl. 294-86.410.

Spengler, Charles J.; and Whitlow, Graham A., to Westinghouse Electric Corp. Spalling and corrosion resistant ceramic coating for land and marine combustion turbines. 4,576,874, Cl. 428-623.000.

Speranza, Donald; Lane, E. James; and Markyvech, Ronald K., to Eaton Corporation. Automatic transmission controls with multiple downshift off-highway mode. 4,576,065, Cl. 74-866.000.

Sperr, Charles J.; Sperr, Douglas C.; and Genrich, Thad J., to Sperr, Charles J.; and Sperr, Douglas C. Evaporative cooling. 4,576,013, Cl. 62-171.000.

Sperr, Douglas C.: *See*—
Sperr, Charles J.; Sperr, Douglas C.; and Genrich, Thad J., 4,576,013, Cl. 62-171.000.

Sperry Corporation: *See*—
Hopper, Michael G.; and Prival, Harri G., 4,577,273, Cl. 364-200.000.
Zbinden, Terry B., 4,577,149, Cl. 324-73.0PC.

Spie-Batignolles: *See*—
Plard, Christian; and Soulie, Jacques, 4,577,093, Cl. 219-376.000.

Spieldiener, Reinhold: *See*—
Spieldiener, Robert; Saiko, Alfons; and Spieldiener, Reinhold, 4,576,373, Cl. 272-41.000.

Spieldiener, Robert; Saiko, Alfons; and Spieldiener, Reinhold. Aerial amusement ride. 4,576,373, Cl. 272-41.000.

Spisak, Andrew M.; and Adduci, Robert L., to General Motors Corporation. Adaptive ride hydraulic damper. 4,576,258, Cl. 188-299.000.

Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Isomer-directed process for producing asymmetric ketones using catalytic Claisen rearrangement of allylic ethers, intermediates, and uses of products and intermediates of process in perfumery. 4,576,741, Cl. 252-522.00R.

Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., to International Flavors & Fragrances Inc. Perfume uses of reactive product containing mono-oxomethyl substituted polyhydrodimethanonaphthalene derivatives. 4,576,742, Cl. 252-522.00R.

Spred-A-Bag Inc.: *See*—
Foster, Robert D., 4,576,316, Cl. 222-541.000.

Square D Starkstrom GmbH: *See*—
Lemmer, Helmut, 4,577,174, Cl. 335-261.000.

SSAB Svenskt Stal AB: *See*—
Grip, Carl E.; Hagstad, Bertil J.; and Andersson, Bjorn H., 4,575,912, Cl. 29-173.000.
Josefsson, Erik A. A., 4,576,655, Cl. 148-12.00F.

Stadler, Heinz: *See*—
Schedele, Helmut; Schweiger, Josef; and Stadler, Heinz, 4,577,173, Cl. 335-80.000.

Stahlecker, Fritz: *See*—
Griesinger, Rolf; and Fetzer, Gerhard, 4,576,000, Cl. 57-416.000.

Stahlecker, Hans: *See*—
Griesinger, Rolf; and Fetzer, Gerhard, 4,576,000, Cl. 57-416.000.

Stahlhofen, Paul; and Mack, Gerhard, to Hoechst Aktiengesellschaft. Process for producing negative copies by means of a material based on 1,2-quinone diazides with 4-ester or amide substitution. 4,576,901, Cl. 430-325.000.

Stamicarbon B.V.: *See*—
Corvers, Antonius; and Hofman, Johannes H. A., 4,577,023, Cl. 546-122.000.

Stanbro, William D.: *See*—
Parker, John G.; and Stanbro, William D., 4,576,173, Cl. 128-633.000.

Standard Oil Company, The: *See*—
Benton, Kenneth C.; and O'Kane, James L., 4,577,008, Cl. 526-342.000.
Hartman, Robert A., 4,577,051, Cl. 136-244.000.

Staniszewski, Tadeusz, to Ziyad Incorporated. Locking assembly for print wheel. 4,576,493, Cl. 400-175.000.

Starnes, Roger A. Serving dish with heating means. 4,575,928, Cl. 29-611.000.

Stauber, Siegfried T., to Wyler AG. Measuring arm for a multiple coordinate measuring machine. 4,575,947, Cl. 33-561.000.

Stauffer Chemical Company: *See*—
Carter, Charles G., 4,576,631, Cl. 71-92.000.

Steiger, Rolf: *See*—
Fryberg, Mario; Schaller, Heinrich; Steiger, Rolf; and Peter, Heinz, 4,576,885, Cl. 430-390.000.

Stein, Robert, to Vining Broom Company, Inc. Gravity feed merchandise display fixture. 4,576,291, Cl. 211-49.100.

Steiner, Alois, to Sulzer Brothers Limited. Weft severing device for a weaving machine. 4,576,208, Cl. 139-429.000.

Steiner Corporation: *See*—
Smith, Randel P.; and Steiner, Robert L., 4,576,313, Cl. 222-81.000.

Steiner, Eginhard: *See*—
Martin, Pierre; and Steiner, Eginhard, 4,577,028, Cl. 546-345.000.

Steiner, Helmut; Ebbinghaus, Wilfried; and Paech, Hartmut, to Bergische Achsenfabrik Fr. Kotz & Sohne. Bearing bushing. 4,576,488, Cl. 384-291.000.

Steiner, Robert L.: *See*—
Smith, Randel P.; and Steiner, Robert L., 4,576,313, Cl. 222-81.000.

Steinke, Rudi: *See*—
Rothaut, Josef; Hausselt, Jurgen; Steinke, Rudi; and Klaus, Angela, 4,576,790, Cl. 420-464.000.

Stelte, David J.: *See*—
Chu, Jean; Hinch, Mark G.; Johnson, James M., Jr.; Kafka, Henry J.; and Stelte, David J., 4,577,314, Cl. 370-94.000.

Steltenkamp, Robert J.: *See*—
Colodney, Daniel; and Steltenkamp, Robert J., 4,576,738, Cl. 252-559.000.

Stempfhuber, Lorenz, to Marker International Company. Electronic ski-binding. 4,576,396, Cl. 280-612.000.

Stenkvist, Sven-Einar: *See*—
Bergman, Kjell; and Stenkvist, Sven-Einar, 4,577,326, Cl. 373-103.000.

Sterling Drug Inc.: *See*—
Paszek, Leon E.; and Gebbia, Barbara, 4,576,729, Cl. 252-106.000.

Sterosynt Ltd.: *See*—
MacDonald, Peter, 4,576,936, Cl. 514-180.000.

Stevens, Joy; and Hemmeter, George T. Vertical action tooth brush. 4,575,894, Cl. 15-172.000.

Stewart, David G.: *See*—
Nay, Barry; and Stewart, David G., 4,576,968, Cl. 518-713.000.

Stewart, Roger G.; and Ipri, Alfred C., to RCA Corporation. Dual word line, electrically alterable, nonvolatile floating gate memory device. 4,577,215, Cl. 357-23.500.

Stickel, Heinz: *See*—
Schwarz, Helmut; and Stickel, Heinz, 4,576,496, Cl. 400-352.000.

Stieber, Michael; Meinke, Peter; and Dreher, Gunther, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Method and device for automatically steering a vehicle. 4,576,246, Cl. 180-168.000.

Stinson, Robert J. Saw blade guard. 4,576,073, Cl. 83-102.100.

Stockwell, Claude L.: *See*—
Cowlam, Stephen K.; Moss, Steven Y.; Stockwell, Claude L.; and Phillips, Victor R., 4,576,765, Cl. 210-801.000.

Stoddart, Barry, to Procter & Gamble Company, The. Cleaning compositions. 4,576,728, Cl. 252-102.000.

Stol, Israel, to Westinghouse Electric Corp. Pressure-differential method for sleeve-to-tube joining. 4,577,084, Cl. 219-85.00M.

Stolar, Inc.: *See*—
Stolarczyk, Larry G., 4,577,153, Cl. 324-334.000.

Stolarczyk, Larry G., to Stolar, Inc. Continuous wave medium frequency signal transmission survey procedure for imaging structure in coal seams. 4,577,153, Cl. 324-334.000.

Storage Technology Partners II: *See*—
Mathews, Harlan P.; and Cambier, Craig, 4,577,301, Cl. 369-44.000.
Woods, John W.; Kummli, Paul; and White, Edward M., 4,577,307, Cl. 369-270.000.

Stout, Gregg W.; Nelson, John A.; and Crisp, John H., to Baker Oil Tools, Inc. Perforation and isolation apparatus. 4,576,236, Cl. 166-386.000.

Strametz, Helmut: *See*—
Dorrer, Bernhard; and Strametz, Helmut, 4,576,994, Cl. 525-247.000.

Strock, Lynn E.: *See*—
Lott, Hamilton, Jr.; and Strock, Lynn E., 4,575,983, Cl. 52-544.000.

Strul, Bruno: *See*—
Corbet, Aaron B.; Holliger, Christoph; and Strul, Bruno, 4,576,477, Cl. 356-39.000.

Stumpe, Werner: *See*—
Muller, Egbert; and Stumpe, Werner, 4,576,416, Cl. 303-15.000.

Sturm, Ruger & Company, Inc.: *See*—
Ruger, William B.; and Melcher, Roy L., 4,575,963, Cl. 42-70.00F.

Sturm, Steven P., to AccuRay Corporation. Measuring the percentage or fractional moisture content of paper having a variable infrared radiation scattering characteristic and containing a variable amount of a broadband infrared radiation absorber. 4,577,104, Cl. 250-339.000.

Suburban Tool, Inc.: *See*—
Bailey, Donald H., 4,577,285, Cl. 364-560.000.

Suda, Masao: *See*—
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Humpolik, Bohumil; Kluna, Vlastimil; Winterer, Wilfried; Kuchelmeister, Reinhold; and Bayer, Jurgen, 4,576,223, Cl. 165-79.000.

Suematsu, Yoshiyuki: *See*—
Echigo, Yoshiaki; Suematsu, Yoshiyuki; and Ishikura, Tadashi, 4,576,969, Cl. 521-28.000.

Sueyasu, Seisuke: *See*—
Yoda, Yasutada; Sueyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, 4,576,559, Cl. 425-28.00R.

Sugano, Akira; Muramatsu, Masaru; Yamanobe, Sachio; and Sato, Yoshio, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Plant control method. 4,577,270, Cl. 364-151.000.

Suganuma, Nobuo; Anzai, Masafumi; Takada, Nobuyuki; and Ichikawa, Hiromichi, to Lion Corporation. Dentifrice composition. 4,576,816, Cl. 424-50.000.

Sugawara, Fukuo; Iwane, Yasuhiko; Hori, Fumihisa; and Onozato, Takashi, to Alps Electric Co., Ltd. Multi-stage printer. 4,576,492, Cl. 400-146.000.

Sugg, Basil R.: *See*—
Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J., 4,576,159, Cl. 128-203.140.

Sugimori, Shigeru; Isoyama, Toyoshiro; and Goto, Yasuyuki, to Chisso Corporation. 4-Halogenobenzoic acid esters. 4,576,733, Cl. 252-299.670.

Sugiuchi, Toshiyasu; Aoyama, Susumu; and Yoshida, Toshio, to Riken Corporation. Method of joining tubular member and annular parts. 4,575,913, Cl. 29-432.000.

Sugiyama, Keiichi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake control system for multi-valve type internal combustion engine. 4,576,131, Cl. 123-432.000.

Sugiyama, Susumu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Semiconductor transducer. 4,576,052, Cl. 73-862.630.

Sugiyama, Tohru; Suzuki, Yasuo; Katagiri, Katsumasa; and Furutani, Satoshi, to Shimizu Pharmaceutical Co., Ltd. Transfusion preparation for intravenous infusion. 4,576,930, Cl. 514-23.000.

Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., to USV Pharmaceutical Corp. Compounds for treating hypertension. 4,576,941, Cl. 514-222.000.

Suh, Sung L.; Burns, Gerald E.; and Silcox, William H., to Chevron Research Company. Motion damping apparatus. 4,576,520, Cl. 405-224.000.
Sujaku, Takamichi, to Kabushiki Kaisha Toshiba. Door of microwave oven. 4,577,079, Cl. 219-10.55D.
Sullivan, David O.: *See—*
Murray, W. Kirby; and Sullivan, David O., 4,576,402, Cl. 285-39.000.
Sullivan, Jeffrey R., to McGard, Inc. Tank hatch opening obstructing construction. 4,576,308, Cl. 220-327.000.
Sulzer Brothers Limited: *See—*
Ammann, Heinz, 4,576,120, Cl. 122-6.00A.
Kunzli, Albert, 4,577,091, Cl. 219-284.000.
Muller, Maurice E.; and Frey, Otto, 4,576,152, Cl. 128-92.00R.
Steiner, Alois, 4,576,208, Cl. 139-429.000.
Sumitomo Bakelite Company Limited: *See—*
Suzuki, Setsuo; Tsuge, Morio; and Nakayama, Syoichi, 4,576,896, Cl. 430-271.000.
Sumitomo Chemical Company, Limited: *See—*
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, 4,576,734, Cl. 252-404.000.
Tatsukami, Yoshiharu; Kato, Yasuyuki; and Wake, Shigeo, 4,576,438, Cl. 350-96.340.
Sumitomo Electric Industries, Ltd.: *See—*
Kawazoe, Chisato; Yoshida, Kenichi; and Tsuno, Koichi, 4,576,146, Cl. 128-6.000.
Tsuno, Koichi; and Nishimura, Akira, 4,576,145, Cl. 128-6.000.
Superior Electric Company, The: *See—*
Lenzing, Richard S., 4,577,146, Cl. 323-341.000.
Sutter Biomedical, Inc.: *See—*
Koerner, Richard J.; Dumas, Christopher C.; Filia, Philip J.; Lawrence, Ronald L.; and Petch, David B., 4,576,148, Cl. 128-26.000.
Suzuki, Masane: *See—*
Cho, Michio; Suzuki, Masane; and Saito, Takayuki, 4,576,458, Cl. 354-199.000.
Suzuki, Ryoichi; Ohno, Jiro; and Gondo, Hisashi, to Nippon Steel Corporation. Hydrogen storage metal material. 4,576,639, Cl. 75-123.00E.
Suzuki, Setsuo; Tsuge, Morio; and Nakayama, Syoichi, to Sumitomo Bakelite Company Limited. Optical recording medium. 4,576,896, Cl. 430-271.000.
Suzuki, Takeshi: *See—*
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.
Suzuki, Yasuo: *See—*
Sugiyama, Tohru; Suzuki, Yasuo; Katagiri, Katsumasa; and Furutani, Satoshi, 4,576,930, Cl. 514-23.000.
Suzuki, Yoichi: *See—*
Noda, Yasumasa; and Suzuki, Yoichi, 4,577,078, Cl. 219-10.55A.
Suzuki, Yuji: *See—*
Urata, Koichi; Takaishi, Naotake; and Suzuki, Yuji, 4,576,967, Cl. 514-772.000.
Suzuyama, Hiroshi: *See—*
Akita, Kenji; Sakaguchi, Minoru; and Suzuyama, Hiroshi, 4,577,075, Cl. 200-148.00R.
Svensson, Jan A.; and Axelsson, Robert. Slide valve and coupling unit. 4,576,199, Cl. 137-614.040.
Sweetana, Andrew S., to Westinghouse Electric Corp. Surge arrester equipped for monitoring functions and method of use. 4,577,148, Cl. 324-72.000.
Swell-Wear, Inc.: *See—*
Wolfe, Henry S., 4,576,087, Cl. 98-1.000.
Swick, George E., Jr., to Bennett Pump Company. Fuel dispensing station. 4,576,312, Cl. 222-27.000.
SWS Inc.: *See—*
Sharp, Charles M., 4,577,088, Cl. 219-121.0LD.
Sy, Kian-Bon K. Routing mechanism with encapsulated FCS for a multi-ring local area network. 4,577,313, Cl. 370-88.000.
Symborski, Alex P.: *See—*
Chappelear, Robert N.; and Symborski, Alex P., 4,576,621, Cl. 65-10.200.
Syska, Andrew J.: *See—*
Massey, Lester G.; Clawson, Lawrence G.; and Syska, Andrew J., 4,575,948, Cl. 34-10.000.
Szentivanyi, Zsolt: *See—*
Buding, Hartmuth; Konigshofen, Heinrich; Szentivanyi, Zsolt; and Thormer, Joachim, 4,576,992, Cl. 525-211.000.
T.A.D. Avanti, Inc.: *See—*
Hanscom, Bradford E.; and Mock, Gerald L., 4,577,063, Cl. 179-6.160.
Tabuchi, Makoto; and Imanishi, Kiyoshi, to Murata Manufacturing Co., Ltd. Automatic producing apparatus of chip-form electronic parts aggregate. 4,575,995, Cl. 53-591.000.
Tachibana, Noriki: *See—*
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.
Tachikawa Spring Co. Ltd.: *See—*
Hatta, Susumu, 4,576,413, Cl. 297-408.000.
Kitamura, Masahiro, 4,576,411, Cl. 297-353.000.
Ohnishi, Yutaka, 4,576,323, Cl. 228-29.000.
Tacito, Louis D.: *See—*
Clark, Richard E.; Tacito, Louis D.; Miller, Bryan H.; and Beck, Martin H., 4,575,915, Cl. 29-509.000.
Tadenuma, Isao: *See—*
Tanahashi, Tooru; and Tadenuma, Isao, 4,576,253, Cl. 187-29.00R.
Tahara, Tetsuya; Ikebe, Tsuguo; Terasawa, Michio; and Imayoshi, Tomonori, to Yoshitomi Pharmaceutical Industries, Ltd. Anti-allergic 3-indolecarboxamides. 4,576,940, Cl. 514-212.000.
Taheri, Syde A. Method and apparatus for monitoring leg blood pressure of an ambulatory patient. 4,576,180, Cl. 128-673.000.
Tajima, Isao, to Asahi Kasei Kogyo Kabushiki Kaisha. Threaded fiber-reinforced plastic member and method of coating the same. 4,576,847, Cl. 428-67.000.
Takada, Juichiro. Latch buckle for seat belt. 4,575,907, Cl. 24-641.000.
Takada, Nobuyuki: *See—*
Suganuma, Nobuo; Anzai, Masafumi; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,576,816, Cl. 424-50.000.
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Ogawa, Kazuyoshi; and Hara, Hideo, to Hitachi, Ltd.; and Hitachi Micro Computer Engineering Ltd. Pulse width modulation circuit and integration circuit of analog product using said modulation circuit. 4,577,154, Cl. 328-158.000.
Takagi Kogyo Co., Ltd.: *See—*
Takagi, Mitsuo, 4,576,106, Cl. 116-63.00R.
Takagi, Mitsuo, to Takagi Kogyo Co., Ltd. Marker rope. 4,576,106, Cl. 116-63.00R.
Takahashi, Hideaki: *See—*
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, 4,576,705, Cl. 204-406.000.
Takahashi, Kenji: *See—*
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
Takahashi, Koji; and Mochizuki, Akira, to Fuji Xerox Co., Ltd. Sorter having guide members. 4,576,371, Cl. 271-296.000.
Takahashi, Osamu; and Sakai, Minoru, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic element with heat treated pyrazolidinone developer. 4,576,906, Cl. 430-497.000.
Takahashi, Shuuji: *See—*
Nakazawa, Masao; Yashima, Michio; and Takahashi, Shuuji, 4,576,879, Cl. 429-86.000.
Takahashi, Tadashi: *See—*
Nishida, Naoto; Takahashi, Tadashi; and Kakizaki, Katsuyuki, 4,577,324, Cl. 372-95.000.
Takahashi, Toru: *See—*
Davis, George T.; Chiang, Chawan-Kang; Antonucci, Joseph M.; and Takahashi, Toru, 4,576,882, Cl. 429-192.000.
Takahashi, Toshio: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, 4,576,956, Cl. 514-380.000.
Takahashi, Yoshihiro; and Rey, Maria A., to Xertex Corporation. X-Ray fluorescence spectrometer and method of calibrating the same. 4,577,338, Cl. 378-048.000.
Takahashi, Yoshinobu: *See—*
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,576,692, Cl. 204-165.000.
Takaishi, Naotake: *See—*
Urata, Koichi; Takaishi, Naotake; and Suzuki, Yuji, 4,576,967, Cl. 514-772.000.
Takakuwa, Yashio: *See—*
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yashio; and Iizumi, Toyoko, 4,577,025, Cl. 546-198.000.
Takami, Masaho, to Shoko Kiko Co., Ltd. Package strapping machine. 4,575,994, Cl. 53-582.000.
Takamura, Koji: *See—*
Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, 4,576,650, Cl. 134-22.120.
Takanashi, Kenji, to Sony Corporation. Apparatus for reproducing a color video signal. 4,577,236, Cl. 358-320.000.
Takata, Yoshinori; and Taki, Mamoru, to Hitachi, Ltd. Flowthrough-type electrolytic cell. 4,576,706, Cl. 204-409.000.
Takayanagi, Takashi: *See—*
Miyazaki, Nobuyuki; Takayanagi, Takashi; and Higaki, Hiromichi, 4,576,977, Cl. 523-137.000.
Takeda Chemical Industries, Inc.: *See—*
Nakabayashi, Masamitsu; Furukawa, Yuzo; and Tashiro, Akira, 4,576,995, Cl. 525-285.000.
Takeda Chemical Industries, Ltd.: *See—*
Imada, Isuke, 4,576,760, Cl. 558-37.000.
Tsurushima, Masaaki; Kokubu, Gozi; and Moriya, Koji, 4,577,012, Cl. 536-24.000.
Tsushima, Susumu; and Nishikawa, Kohei, 4,576,933, Cl. 514-77.000.
Takeda, Nobuhiro; Hattori, Masaichi; and Hanaki, Akira, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Light responsive switch structure for use in a motor vehicle or the like. 4,577,117, Cl. 307-10.00R.
Takemoto, Iwao: *See—*
Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Ozaki, Toshifumi; Seki, Koichi; Takahashi, Kenji; Akiyama, Toshiyuki; Takemoto, Iwao; Imaide, Takuya; Okuda, Akihide; and Kubo, Masaharu, 4,577,231, Cl. 358-212.000.
Ozawa, Naoki; Akiyama, Toshiyuki; Nagahara, Shuusaku; and Takemoto, Iwao, 4,577,230, Cl. 358-212.000.

Takemura, Minoru: *See—*
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.

Takeuchi, Kenji: *See—*
Nishu, Mitsufumi; Takeuchi, Kenji; Sato, Masanori; Horiuchi, Ichiro; Muramatsu, Katsuhiko; and Kiryu, Koji, 4,576,059, Cl. 74-473.00P.

Takeuchi, Takashi; Nishimura, Keizo; Kobayashi, Masaharu; and Oiso, Kazumasa, to Hitachi, Ltd. Error flag processor. 4,577,319, Cl. 371-38.000.

Takeuchi, Takashi: *See—*
Kondo, Haruyoshi; Takahashi, Hideaki; Saji, Keiichi; Takeuchi, Takashi; and Hayakawa, Kiyoharu, 4,576,705, Cl. 204-406.000.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.

Taki, Mamoru: *See—*
Takata, Yoshinori; and Taki, Mamoru, 4,576,706, Cl. 204-409.000.

Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, to Japanese National Railways; and Hakusan Seisakusho Co., Ltd. Gas pressure welding machine. 4,576,324, Cl. 228-44.300.

Takizawa, Kazushige: *See—*
Hirokazu, Sakaki; and Takizawa, Kazushige, 4,576,686, Cl. 204-33.000.

Takizawa, Yoshio: *See—*
Hirose, Naohiro; Sasaki, Osamu; and Takizawa, Yoshio, 4,576,886, Cl. 430-59.000.

Talbo, Henri: *See—*
Collin, Jean J.; Landreau, Alain; Talbo, Henri; Martin, Guy; and Morvan, Jean, 4,576,717, Cl. 210-610.000.

Talpo, Gianpietro, to Sace S.p.A. Costruzioni Elettromeccaniche. Electrical circuit breaker with arc extinguishing compressed fluid. 4,577,073, Cl. 200-148.00A.

Tamas, Istvan; Riederauer, Szilard; and Kovacs, Janos, to Vasipari Kutato es Fejleszto Vallalat. Process for preparing silicon-base complex ferrous alloys. 4,576,637, Cl. 75-10.00R.

Tames, Walter: *See—*
Oliver, Vincent S.; Tames, Walter; Prochaska, Helmuth H.; and Wieser, Karl-Heinz, 4,576,649, Cl. 106-308.00Q.

Tamplin, Paul; and Heaven, Malcolm D., to Raychem Limited. Low density polyethylene polymeric compositions. 4,576,993, Cl. 525-240.000.

Tamura, Yoshiharu: *See—*
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, 4,576,132, Cl. 123-438.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Wagatsuma, Mitsuyoshi; Hatsuno, Susumu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,576,938, Cl. 514-206.000.

Tanahashi, Tooru; and Tadenuma, Isao, to Mitsubishi Denki Kabushiki Kaisha. Velocity control apparatus for an elevator. 4,576,253, Cl. 187-29.00R.

Tanaka, Akihiro: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.

Tanaka, Masanori; Maehara, Atsushi; and Kanai, Junichi, to Hokuetsu Industries Co., Ltd. Screw rotor assembly. 4,576,558, Cl. 418-150.000.

Tanaka, Masanori: *See—*
Kobayashi, Osamu; Tanaka, Masanori; and Ishii, Jun, 4,576,275, Cl. 194-203.000.

Tanaka, Mitsuo, to Yanmar Diesel Engine Co., Ltd. Gas-diesel dual fuel engine. 4,576,137, Cl. 123-575.000.

Tanaka, Sakuya: *See—*
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,576,934, Cl. 514-85.000.

Tanaka Seiko Co. Ltd.: *See—*
Tanaka, Tomomasa, 4,576,288, Cl. 209-609.000.

Tanaka, Shinya, to Tokyo Kogaku Kikai Kabushiki Kaisha. Photo-therapeutic apparatus with spot size regulating means. 4,576,160, Cl. 128-303.100.

Tanaka, Tomiji: *See—*
Sato, Noboru; and Tanaka, Tomiji, 4,576,699, Cl. 204-192.00M.

Tanaka, Tomomasa, to Tanaka Seiko Co. Ltd. Card sorting machine. 4,576,288, Cl. 209-609.000.

Tanaka, Yoshiaki: *See—*
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,577,188, Cl. 340-721.000.

Tanaka, Yoshikazu: *See—*
Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,576,265, Cl. 192-0.055.

Tanaka, Yoshinari; Aoyama, Akimasa; Moritani, Takeshi; Satoh, Kenji; and Okaya, Takuji, to Kuraray Co., Ltd. Saponified products of silicon-containing ethylene-vinyl acetate copolymer as melt molding materials. 4,576,988, Cl. 524-503.000.

Tani, Isamu: *See—*
Fujita, Takayuki; Kitazawa, Yoshikazu; Akita, Tadashi; and Tani, Isamu, 4,577,032, Cl. 548-341.000.

Tani, Nobutaka; and Hayashi, Tsuneo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Adsorbent and process for preparing the same. 4,576,928, Cl. 502-404.000.

Tanisaka, Satoshi; and Michiguchi, Yoshihiro, to Hitachi, Ltd. Spark monitor device for current collectors. 4,577,151, Cl. 324-158.0MG.

Tapp, William T.; and Fullinwider, Ranson R. Retrievable subsurface well casing slip and packer apparatus and method. 4,576,230, Cl. 166-382.000.

Tarancon Corporation: *See—*
Tarancon, Gregorio; Acevedo, Efrain; and Saud, Abel, 4,576,837, Cl. 427-255.400.

Tarancon, Gregorio; Acevedo, Efrain; and Saud, Abel, to Tarancon Corporation. Method of treating surfaces. 4,576,837, Cl. 427-255.400.

Tarnawskyj, Ihor W.: *See—*
Badesha, Santokh S.; Pai, Damodar M.; Carmichael, Kathleen M.; and Tarnawskyj, Ihor W., 4,576,634, Cl. 75-0.50A.

Tashiro, Akira: *See—*
Nakabayashi, Masamitsu; Furukawa, Yuzo; and Tashiro, Akira, 4,576,995, Cl. 525-285.000.

Tatemoto, Masayoshi: *See—*
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.

Tatsukami, Yoshiharu; Kato, Yasuyuki; and Wake, Shigeo, to Sumitomo Chemical Company, Limited. Heat-resisting optical fiber. 4,576,438, Cl. 350-96.340.

Taurand, Gerard: *See—*
Bourzat, Jean-Dominique; Cotrel, Claude; Farge, Daniel; Paris, Jean-Marc; and Taurand, Gerard, 4,576,954, Cl. 514-314.000.

Tawara, Katsuya: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; Takahashi, Toshio; and Konishi, Takao, 4,576,956, Cl. 514-380.000.

Taylor, Dale F.; and Sammler, Louis S., to General Electric Company. Process for preparing a sintered ceramic article with porous region. 4,576,667, Cl. 156-89.000.

Taylor, Lawrence H. Housing development building arrangement. 4,575,977, Cl. 52-169.300.

Team, Inc.: *See—*
Harrison, George W., 4,576,401, Cl. 285-15.000.

Technicare Corporation: *See—*
Carlson, Roland W.; and Blaskis, Edward A., 4,577,340, Cl. 378-132.000.

Technicon Instruments Corporation: *See—*
Yaverbaum, Sidney; and Kusnetz, Jacob, 4,576,912, Cl. 435-7.000.

Teculescu, Nicholas: *See—*
Bodenan, Rene; and Teculescu, Nicholas, 4,575,952, Cl. 34-54.000.

Tecumseh Products Company: *See—*
Ashenfelter, Roger N., 4,576,555, Cl. 417-372.000.

Tedder, Bob L. Wheel protector. 4,576,301, Cl. 220-1.00C.

Teijin Limited: *See—*
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, 4,576,700, Cl. 204-192.00M.
Sasaki, Ichitaro; Mori, Takashi; and Tsuyuguchi, Tadao, 4,576,344, Cl. 242-67.10R.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Brie, Richard; and Guidoux, Loic B. Y., 4,577,329, Cl. 375-14.000.

Telefunken electronic GmbH: *See—*
Heigl, Franz; and Rehm, Josef, 4,577,171, Cl. 334-1.000.

Tempo Sanys: *See—*
Caumont, Jean-Francois, 4,575,992, Cl. 53-520.000.

Tenore, Richard R.: *See—*
Guth, Jacob J.; Lukenbach, Elvin R.; and Tenore, Richard R., 4,576,757, Cl. 260-404.500.

Terada, Takami, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Seat reclining mechanism. 4,576,412, Cl. 297-362.000.

Teramachi, Hiroshi. Linear slide bearing. 4,576,421, Cl. 308-6.00C.

Terasawa, Michio: *See—*
Tahara, Tetsuya; Ikebe, Tsuguo; Terasawa, Michio; and Imayoshi, Tomonori, 4,576,940, Cl. 514-212.000.

Terashima, Kanetsugu: *See—*
Isogai, Masato; Hattori, Shintaroo; Iwasaki, Kishiroo; Kitamura, Teruo; Mukoh, Akio; Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saitoh, Shinichi, 4,576,732, Cl. 252-299.650.

Terio, Charles J. Terrorist vehicle barrier. 4,576,507, Cl. 404-6.000.

Terpstra, Daniel A.; and Brundage, Richard B., to Emerson Electric Co. Sawdust collection apparatus for a table saw. 4,576,072, Cl. 83-102.100.

Terrance D. Hohner: *See—*
Charney, Gregory S.; Hohner, Terrance D.; and Salibello, Cosmo, 4,576,454, Cl. 351-243.000.

Terrot Strickmaschinen GmbH: *See—*
Schindele, Alfred, 4,576,018, Cl. 66-106.000.

Terumo Medical Corporation: *See—*
Proud, Todd A.; Lin, Tom F.; Mitchell, Wayne J.; and Kasper, James D., 4,576,185, Cl. 128-760.000.

Terzian, Rouben T.: *See—*
Balogh, John M.; and Terzian, Rouben T., 4,576,585, Cl. 446-199.000.

Teshiba, Toko: *See—*
Miyake, Hidenori; Fujiwara, Shunji; Nakazato, Yoshio; Yanagishima, Fumiya; and Teshiba, Toko, 4,576,029, Cl. 72-205.000.

Tetra-Tech, Inc.: *See—*
Hodara, Henri; and Wells, Willard H., 4,577,184, Cl. 340-566.000.

Tetsuka, Shigeo, to Victor Company of Japan, Ltd. Tape recorder having a mechanism for preventing erroneous setting to a recording mode. 4,577,242, Cl. 360-60.000.

Texaco Inc.: *See*—
Dowling, Donald J.; and Palmer, Harold A., 4,576,231, Cl. 166-248.000.
Huang, Wann-Sheng; Mims, Donald S.; and Allen, Richard S., 4,576,036, Cl. 73-29.000.
Marshall, Hubert T., II; Vest, Eugene W.; and Villforth, Frederick J., III, 4,576,476, Cl. 356-28.000.
Martin, Roy D., 4,576,041, Cl. 73-151.000.
Texas Instruments Incorporated: *See*—
Caudel, Edward R.; and Magar, Surendar S., 4,577,282, Cl. 364-200.000.
Hynecek, Jaroslav, 4,577,232, Cl. 358-213.000.
Reed, Mark A.; and Bate, Robert T., 4,575,924, Cl. 29-576.00E.
Thai, Phi: *See*—
Brown, George W.; and Thai, Phi, 4,577,294, Cl. 365-200.000.
Thames Water Authority: *See*—
Hurley, Brian J. E.; and Rachwal, Anthony J., 4,576,719, Cl. 210-620.000.
Thayer, C. Kenneth. Fixture for securing an electrical connector. 4,576,431, Cl. 339-131.000.
Theeuwes, Felix: *See*—
Guittard, George V.; Deters, Joseph C.; Theeuwes, Felix; and Cortese, Richard, 4,576,604, Cl. 604-890.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping machine. 4,576,095, Cl. 104-12.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Box car. 4,576,538, Cl. 414-339.000.
Thew, Martin T.: *See*—
Colman, Derek A.; and Thew, Martin T., 4,576,724, Cl. 210-788.000.
Thiel, Klaus-Peter: *See*—
Baron, Winfried; Marquard, Kurt; Merrem, Hans-Joachim; Sindlinger, Raimund; and Thiel, Klaus-Peter, 4,576,903, Cl. 430-331.000.
Thioux, Alain: *See*—
Mery, Jean-Claude; Carre, Jean-Jacques; and Thioux, Alain, 4,576,255, Cl. 188-71.500.
Thistlethwaite, Stuart R., to Anglo Blackwells Limited. Aluminium-strontium-titanium-boron master alloy. 4,576,791, Cl. 420-552.000.
Thoene, Mark: *See*—
Combs, Cathy M.; Duffy, Joseph K.; and Thoene, Mark, 4,576,017, Cl. 62-372.000.
Thomas, Erwin: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,576,804, Cl. 423-265.000.
Thomas, Gary M. Rocking horse with interconnected rockers. 4,576,374, Cl. 272-52.500.
Thomas, John H., III: *See*—
Kaganowicz, Grzegorz; Robinson, John W.; and Thomas, John H., III, 4,576,829, Cl. 427-39.000.
Thompson, Howard J., to Medtronic, Inc. Roller pump. 4,576,556, Cl. 417-477.000.
Thomson-CSF: *See*—
Clerc, Guy, 4,577,134, Cl. 313-346.00R.
Cornet, Jean, 4,577,291, Cl. 365-126.000.
Huignard, Jean P.; Rajbenbach, Henri; Loiseaux, Brigitte; and Herriau, Jean P., 4,576,434, Cl. 350-3.640.
Thomson-CSF Broadcast, Inc.: *See*—
Kruger, Robert A.; and Nelson, James A., 4,577,222, Cl. 358-111.000.
Thormer, Joachim: *See*—
Buding, Hartmuth; Konigshofen, Heinrich; Szentivanyi, Zsolt; and Thormer, Joachim, 4,576,992, Cl. 525-211.000.
Thorogood, Robert M., to International Coal Refining Company. Convective heater. 4,576,121, Cl. 122-7.00R.
Thorpe, Denis, to Development Finance Corporation of New Zealand. Locking member. 4,576,247, Cl. 181-243.000.
Thorsen, Kjeld, to Cart-O-Matic Aktiebolag. Means for the storing of carts such as shopping carts. 4,576,274, Cl. 194-210.000.
Thurman, Lamar; Otting, Billy J.; and Otting, David L., to Otting International, Inc. Jet printer. 4,576,020, Cl. 68-205.00R.
Tidwell, Charles J., Jr.: *See*—
Powell, Larry D.; and Tidwell, Charles J., Jr., 4,575,883, Cl. 5-13.000.
TIE/Communications, Inc.: *See*—
Korsky, Vincent V.; and Laotetpitaks, Chansak, 4,577,310, Cl. 370-58.000.
Timberjack Inc.: *See*—
Johnson, Thomas E.; and Spencer, Terrance D., 4,576,406, Cl. 294-86.410.
Timms, Colin T.: *See*—
Silcock, Terence M. B.; and Timms, Colin T., 4,576,133, Cl. 123-458.000.
Ting, Sai-Pei: *See*—
Cooper, Glenn D., deceased; and Ting, Sai-Pei, 4,576,991, Cl. 525-146.000.
Titus, Timothy C., to Wells Manufacturing Corporation. Spring-biased tensioning device for a band saw blade. 4,576,077, Cl. 83-816.000.
Toda, Gyozo: *See*—
Kuroki, Takashi; Fujita, Tsuyoshi; Toda, Gyozo; Ishihara, Shousaku; and Ohzawa, Yoshiyuki, 4,576,735, Cl. 252-512.000.
Todd, Craig C.: *See*—
Allen, Ioan R.; and Todd, Craig C., 4,577,305, Cl. 369-86.000.
Toder, Ellis I. Wheeled locking carrier. 4,576,096, Cl. 104-94.000.
Togashi, Osamu: *See*—
Fujikawa, Junichi; Togashi, Osamu; and Kashio, Shigetra, 4,576,897, Cl. 430-273.000.
Toho Beslon Co., Ltd.: *See*—
Shimazaki, Kenji, 4,576,929, Cl. 502-417.000.
Tokarzewski, Richard J.: *See*—
Sprecker, Mark A.; Hanna, Marie R.; Tokarzewski, Richard J.; Belko, Robert P.; Watkins, Hugh; and Vock, Manfred H., 4,576,742, Cl. 252-522.00R.
Tokushige, Keinosuke: *See*—
Ohki, Toshio; Matsumoto, Masaomi; Sakuraya, Takashi; Tokushige, Keinosuke; and Hoshino, Shuji, 4,575,972, Cl. 51-251.000.
Tokuyama, Yoshio, to Victor Company of Japan, Ltd. Control signal generating circuit for a magnetic recording and/or reproducing apparatus. 4,577,243, Cl. 360-70.000.
Tokyo Denshi Kagaku Co., Ltd.: *See*—
Uehara, Akira; Uehara, Takashi; Saito, Miyuki; and Ishida, Toshiyuki, 4,577,165, Cl. 331-109.000.
Tokyo Gas Co., Ltd.: *See*—
Morinaga, Akio; Sakaguchi, Yoichi; Hyodo, Masakatsu; and Yagi, Isaburo, 4,576,205, Cl. 138-98.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Tanaka, Shinya, 4,576,160, Cl. 128-303.100.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kobayashi, Akira; and Kojima, Tadashi, 4,577,155, Cl. 328-164.000.
Kobayashi, Masahiro, 4,576,784, Cl. 376-352.000.
Watanabe, Tomohide, 4,577,095, Cl. 250-201.000.
Tolonen, Eric O.: *See*—
Snyder, Robert H.; and Tolonen, Eric O., 4,576,339, Cl. 241-120.000.
Tomcufcik, Andrew S.; Meyer, Walter E.; Dusza, John P.; and Tseng, Shin S., to American Cyanamid Company. Pyrazolo[1,5-a]pyrimidines. 4,576,943, Cl. 514-222.000.
Tomie, Takashi: *See*—
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, 4,576,700, Cl. 204-192.00M.
Tomihashi, Nobuyuki: *See*—
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.
Tominaga, Katsuya, to Hakko Seiki Kabushiki Kaisha. Aiming telescope. 4,576,451, Cl. 350-566.000.
Tomita, Yuichi: *See*—
Kiuchi, Eiichi; Sawanaka, Hiroshi; and Tomita, Yuichi, 4,577,193, Cl. 343-380.000.
Tomy Kogyo Co., Inc.: *See*—
Yoneda, Yosuke, 4,576,583, Cl. 446-94.000.
Topor, Michael G.: *See*—
Socola, Helen M.; and Topor, Michael G., 4,576,108, Cl. 118-19.000.
Toray Industries, Incorporated: *See*—
Fujikawa, Junichi; Togashi, Osamu; and Kashio, Shigetra, 4,576,897, Cl. 430-273.000.
Ohigashi, Hiroji; Koga, Keiko; and Nakanishi, Toshiharu, 4,577,132, Cl. 310-800.000.
Torii, Nobutoshi: *See*—
Inaba, Hajimu; and Torii, Nobutoshi, 4,576,537, Cl. 414-222.000.
Torrey, Ralph H. Device of unitary construction for adjustably hanging a picture. 4,575,905, Cl. 24-129.00R.
Totani, Tetsushi; and Aono, Katsutoshi, to Shionogi & Co., Ltd. Glycolic acid type platinum complexes. 4,577,038, Cl. 556-137.000.
Totsuka, Masao: *See*—
Kitagawa, Takahiro; and Totsuka, Masao, 4,576,475, Cl. 355-91.000.
Touchstone Corporation: *See*—
Perkins, Earl, 4,576,730, Cl. 252-174.140.
Tournier, Joseph H.: *See*—
Felthuis, Jacob; and Tournier, Joseph H., 4,576,081, Cl. 87-6.000.
Townsend, Keith G.: *See*—
Keel, Frederick; Townsend, Keith G.; and Carter, Marshall C., 4,576,019, Cl. 66-147.000.
Toy, Wing N.: *See*—
Larson, Mikiel L.; and Toy, Wing N., 4,577,308, Cl. 370-9.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Emura, Noriaki; Ariyoshi, Takashi; and Kato, Toshikazu, 4,577,004, Cl. 526-204.000.
Toyo Tire & Rubber Company Limited: *See*—
Watanabe, Masato; and Ozaki, Yuzo, 4,576,726, Cl. 252-62.540.
Toyoda, Keiichi: *See*—
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,576,063, Cl. 74-745.000.
Donomoto, Tadashi; Koyama, Mototsugu; Fuwa, Yoshio; Miura, Nobuhiro; and Sakakibara, Tatsuo, 4,576,863, Cl. 428-325.000.
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,576,692, Cl. 204-165.000.
Miura, Hirohisa; Satou, Hiroshi; Katagiri, Hidenori; Natsume, Toshio; and Azuma, Hidekazu, 4,576,725, Cl. 252-62.510.
Terada, Takami, 4,576,412, Cl. 297-362.000.
Tracy, Catherine O.; Binkerd, Evan F.; Rendek, Robert B.; and Wrobel, Raymond J., to Conagra, Inc. Method and composition for curing meat. 4,576,825, Cl. 426-266.000.

Travis, Alan J. B., to United Kingdom Atomic Energy Authority. Optical alignment system. 4,576,480, Cl. 356-152.000.

Tri-State Oil Tool Industries, Inc.: *See—*
Murray, W. Kirby; and Sullivan, David O., 4,576,402, Cl. 285-39.000.

Trio Kabushiki Kaisha: *See—*
Naito, Michinori, 4,577,342, Cl. 381-13.000.

Tritsch, Ludwig, to Personal Products Company. Disposable diaper with improved adhesive tab system. 4,576,598, Cl. 604-390.000.

Trop, Harvey S.: *See—*
Kohl, Paul A.; Smith, Lawrence E.; and Trop, Harvey S., 4,576,691, Cl. 204-129.300.

Trotter, Jimmy R.; and McConnell, Richard L., to Eastman Kodak Company. Adhesive blends. 4,576,997, Cl. 525-444.000.

Trumpf GmbH & Co.: *See—*
Klingel, Hans; and Brekle, Erich, 4,575,969, Cl. 51-131.100.

Trustees Boston University: *See—*
McCaffrey, Ronald; Wright, George; and Baril, Earl F., 4,576,948, Cl. 514-274.000.

TRW Inc.: *See—*
Johnson, Ronald M., 4,576,135, Cl. 123-490.000.
Rau, Jim L.; and LaHue, Ronald L., 4,576,003, Cl. 60-384.000.

Tsang, Won-Tien: *See—*
Logan, Ralph A.; and Tsang, Won-Tien, 4,575,919, Cl. 29-569.00L.

Tsay, Wei-Shin: *See—*
Meeker, Thrygve R.; and Tsay, Wei-Shin, 4,577,169, Cl. 333-194.000.

Tseng, Shin S.: *See—*
Tomcufcik, Andrew S.; Meyer, Walter E.; Dusza, John P.; and Tseng, Shin S., 4,576,943, Cl. 514-222.000.

Tsuchiya, Kiyoshi: *See—*
Morimoto, Keiji; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Tsuchiya, Kiyoshi; Ogata, Kojiro; and Miyanagi, Naoki, 4,576,515, Cl. 405-184.000.

Tsuchiya, Kunimasa: *See—*
Nakao, Shinroku; and Tsuchiya, Kunimasa, 4,575,896, Cl. 16-35.00R.

Tsuchiya, Tsutomu: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.

Tsuge, Morio: *See—*
Suzuki, Setsuo; Tsuge, Morio; and Nakayama, Syoichi, 4,576,896, Cl. 430-271.000.

Tsuji, Nobuo: *See—*
Okita, Tsutomu; Tsuji, Nobuo; and Mukaida, Yoshito, 4,576,866, Cl. 428-336.000.

Tsukahara, Daiki: *See—*
Daitoku, Koichi; and Tsukahara, Daiki, 4,576,460, Cl. 354-400.000.

Tsunashima, Yoshitaka, to Kabushiki Kaisha Toshiba. Method of manufacturing an insulated-gate field-effect transistor. 4,575,920, Cl. 29-571.000.

Tsunematsu, Hiroshi: *See—*
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.

Tsuno, Koichi; and Nishimura, Akira, to Sumitomo Electric Industries, Ltd. Fiberscope. 4,576,145, Cl. 128-6.000.

Tsuno, Koichi: *See—*
Kawazoe, Chisato; Yoshida, Kenichi; and Tsuno, Koichi, 4,576,146, Cl. 128-6.000.

Tsurushima, Masaaki; Kokubu, Gozi; and Moriya, Koji, to Takeda Chemical Industries, Ltd. Method of separation of nucleotides and nucleosides from each other. 4,577,012, Cl. 536-24.000.

Tsushima, Susumu; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. Method of use of 1-(alkyl for alkylcarbanoyl)-2-carbamoylglycerol derivatives. 4,576,933, Cl. 514-77.000.

Tsuyama Mfg. Co., Ltd.: *See—*
Tsuyama, Sadaharu, 4,577,261, Cl. 362-72.000.

Tsuyama, Sadaharu, to Tsuyama Mfg. Co., Ltd. Lamp mounting structure for bicycle. 4,577,261, Cl. 362-72.000.

Tsuyuguchi, Tadao: *See—*
Sasaki, Ichitaro; Mori, Takashi; and Tsuyuguchi, Tadao, 4,576,344, Cl. 242-67.10R.

Twickler, Carl: *See—*
Shukla, Jayendra G.; Sohn, Ki G.; Twickler, Carl; and de Pierne, Otto S., 4,576,612, Cl. 51-295.000.

Tyler, Daniel W.: *See—*
Kelly, Thomas J.; and Tyler, Daniel W., 4,577,068, Cl. 179-100.00R.

Tyrell, John A.; and Freimiller, Gary L., to General Motors Company. Hydrolytically stabilized polycarbonates. 4,576,982, Cl. 524-84.000.

Tyrrell, Paul J.: *See—*
Hahn, Clive E. W.; Palayiwa, Eileen; Lindsay-Scott, David J.; Sugg, Basil R.; and Tyrrell, Paul J., 4,576,159, Cl. 128-203.140.

Tysoe, Nicholas W., to Britax Vega Limited. Vehicle lamp assemblies. 4,577,260, Cl. 362-61.000.

Tzifkansky, Guy; and Marchais, Jean-Claude, to Cidelcem. Food container. 4,576,309, Cl. 220-366.000.

Uchida, Hiroshi: *See—*
Matsui, Isamu; Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,576,341, Cl. 242-35.50A.

Ueda, Eiichi: *See—*
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.

Uehara, Akira; Uehara, Takashi; Saito, Miyuki; and Ishida, Toshiyuki, to Tokyo Denshi Kagaku Co., Ltd. High-frequency oscillator with power amplifier and automatic power control. 4,577,165, Cl. 331-109.000.

Uehara, Takashi: *See—*
Uehara, Akira; Uehara, Takashi; Saito, Miyuki; and Ishida, Toshiyuki, 4,577,165, Cl. 331-109.000.

Ueno, Takeshi: *See—*
Arakawa, Tadao; Ueno, Takeshi; Tsunematsu, Hiroshi; Toyoda, Keiichi; and Hashimoto, Tsuguo, 4,576,007, Cl. 60-660.000.

Uesaka, Yasutaro: *See—*
Shiiki, Kazuo; Shiroishi, Yoshihiro; Kitakami, Osamu; and Uesaka, Yasutaro, 4,576,876, Cl. 428-679.000.

Ueyama, Katsuyoshi: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Kobayashi, Akio; Aoki, Keiichi; Nakamura, Mitsuo; and Hagiwara, Kenzo, 4,576,324, Cl. 228-44.300.

UHDE GmbH: *See—*
Koch, Manfred; Muhlhaus, Ludwig; Lambach, Rolf; and Grochowski, Horst, 4,576,924, Cl. 502-56.000.

Ullo, John J.: *See—*
Sherman, Harold; and Ullo, John J., 4,577,102, Cl. 250-269.000.

Ulrich, Klaus: *See—*
Doerr, Hermann; Hoster, Thomas; Neuschuetz, Dieter; Radke, Dietrich; Janssen, Wilhelm; and Ulrich, Klaus, 4,576,638, Cl. 75-80.000.

Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, to Fuji Machinery Company, Ltd. Adjustable tube forming apparatus. 4,576,588, Cl. 493-475.000.

Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation). 23-C-Substituted mycaminosyl tylonolide, pharmaceutical compositions and method of use. 4,576,931, Cl. 514-30.000.

Umezawa, Mitsuo: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,576,061, Cl. 74-665.00T.

Umezawa, Sumio: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.

Uncles, Philip B.: *See—*
Moulton, Alexander E.; and Uncles, Philip B., 4,576,393, Cl. 280-276.000.

Ungchusri, Tep; and Jakubowski, William J., to FMC Corporation. Fluid packing assembly with alternating diverse seal ring elements. 4,576,385, Cl. 277-124.000.

Uni-Cardan Aktiengesellschaft: *See—*
Orain, Michel A., 4,576,503, Cl. 403-259.000.

Union Camp Corporation: *See—*
Hollis, Samuel D., 4,577,006, Cl. 526-283.000.

Union Carbide Corporation: *See—*
D'Silva, Themistocles D. J., 4,576,965, Cl. 514-564.000.
Hartsing, Tyler F.; Sauers, Marvin E.; and Robeson, Lloyd M., 4,576,842, Cl. 428-35.000.
Morland, Robert B.; Cooke, Anson R.; and Bishop, John R., 4,576,629, Cl. 71-90.000.
Pevzner, Boris, 4,576,557, Cl. 417-539.000.

Union Oil Company of California: *See—*
Hass, Robert H.; and Ward, John W., 4,576,814, Cl. 423-573.00G.
Ward, John W.; and Carlson, Timothy L., 4,576,711, Cl. 208-111.000.

Uniroyal, Inc.: *See—*
Snyder, Robert H.; and Tolonen, Eric O., 4,576,339, Cl. 241-120.000.

United Kingdom Atomic Energy Authority: *See—*
Cowlam, Stephen K.; Moss, Steven Y.; Stockwell, Claude L.; and Phillips, Victor R., 4,576,765, Cl. 210-801.000.
Duncombe, Edward; and Winstanley, John P., 4,576,781, Cl. 376-247.000.
Jeffries, Derek K.; and McMillan, Duncan J., 4,577,135, Cl. 313-362.100.
Lane, Edward S., 4,576,921, Cl. 501-12.000.
Travis, Alan J. B., 4,576,480, Cl. 356-152.000.

United States Gypsum Company: *See—*
Porter, William F.; Porter, Michael J.; and Johnson, Dwight E., 4,576,620, Cl. 65-9.000.

United States of America
Air Force: *See—*
Armington, Alton F.; and Larkin, John J., 4,576,808, Cl. 423-335.000.
deRonde, Henry M., 4,577,054, Cl. 174-35.00C.
Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., 4,577,103, Cl. 250-316.100.
Milberger, Walter E.; and Jones, Franklin B., 4,577,166, Cl. 332-9.00T.
Wiegand, Richard J., 4,577,192, Cl. 343-18.0/E.
Army: *See—*
Anitole, George, 4,576,904, Cl. 430-347.000.
Levy, Stephen; O'Connell, Joseph C.; Wright, William H., Jr.; and Weiner, Maurice, 4,577,114, Cl. 250-551.000.
Meador, Jacqueline C., 4,576,094, Cl. 102-202.120.
Commerce: *See—*
Dils, Ray R., 4,576,486, Cl. 374-131.000.
Energy: *See—*
Bates, John F.; Brager, Howard R.; and Korenko, Michael K., 4,576,641, Cl. 75-128.00P.

Glatthorn, Raymond H., 4,576,068, Cl. 82-1.400.
Glatthorn, Raymond H., 4,576,228, Cl. 165-162.000.
Guggenheim, S. Frederic, 4,576,201, Cl. 137-624.180.
Kerst, Donald W., 4,577,156, Cl. 328-237.000.
Health and Human Services: *See—*
Corbet, Aaron B.; Holliger, Christoph; and Strul, Bruno, 4,576,477, Cl. 356-39.000.
National Aeronautics and Space Administration: *See—*
Gahn, Randall F., 4,576,878, Cl. 429-15.000.
Navy: *See—*
Davis, George T.; Chiang, Chawan-Kang; Antonucci, Joseph M.; and Takahashi, Toru, 4,576,882, Cl. 429-192.000.
U.S. Philips Corporation: *See—*
Bertram, Leo, 4,577,129, Cl. 310-112.000.
Bremer, Joannes G.; and Compaan, Klaas, 4,577,101, Cl. 250-231.0SE.
Fink, Mathias A.; and Cardoso, Jean-Francois, 4,576,046, Cl. 73-631.000.
Haenen, Henricus W. G.; and van Leeuwen, Antonie, 4,577,217, Cl. 358-14.000.
Hooghordel, Rijk; and van Jole, Franciscus P., 4,577,136, Cl. 313-481.000.
Koken, Karel G. M.; van de Kerkhof, Hubertus F. W.; Olierook, John C. J.; and Beyersbergen van Henegouwen, Cornelis M., 4,576,345, Cl. 242-198.000.
Scholten, Pieter C.; and Eijnthoven, Ronald K., 4,576,833, Cl. 427-67.000.
Schwieker, Horst H.; and Gieschen, Kurt, 4,577,341, Cl. 378-150.000.
Van Den Crommenacker, Johannes D. P.; and Lohstroh, Jan, 4,577,123, Cl. 307-446.000.
United States Surgical Corporation: *See—*
Green, David T.; and McGarry, Richard A., 4,576,165, Cl. 128-305.000.
Noiles, Douglas G., 4,576,167, Cl. 128-334.00R.
United Technologies Corporation: *See—*
Adams, Don L.; Evans, Charles W.; and Wright, Stuart C., 4,577,275, Cl. 364-433.000.
Kubick, Frederick, 4,576,441, Cl. 350-355.000.
Meltz, Gerald; Allen, Louis B., Jr.; and Ferrar, Carl M., 4,577,100, Cl. 250-231.00P.
Newman, Leon A.; and Kennedy, John T., 4,577,323, Cl. 372-64.000.
Weiner, Harvey I.; and Allard, Kenneth L., 4,576,547, Cl. 415-116.000.
Unitika Ltd.: *See—*
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Ida, Hiroaki; Fujii, Masahiro; and Haruta, Toshio, 4,576,716, Cl. 210-496.000.
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Hylarides, Mark D.; and Mettler, Fred A., Jr., 4,577,046, Cl. 568-312.000.
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UOP Inc.: *See—*
Greenwood, Arthur R., 4,576,712, Cl. 208-138.000.
Upchurch, James M., to Schlumberger Technology Corporation. Full bore sampler valve. 4,576,234, Cl. 166-319.000.
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Gall, Martin, 4,577,020, Cl. 544-366.000.
McCall, John M., 4,577,021, Cl. 544-376.000.
Morris, Joel, 4,576,758, Cl. 260-405.500.
Smith, Herman W., 4,576,949, Cl. 514-277.000.
White, Cathleen A.; Senne, Richard K.; and Rutherford, Harry, 4,576,399, Cl. 282-8.00R.
Uram, Stuart Z., to Certech Incorporated. Molten metals filter apparatus. 4,576,219, Cl. 164-358.000.
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Floreancig, Antoine, 4,576,802, Cl. 423-20.000.
Urata, Koichi; Takaishi, Naotake; and Suzuki, Yuji, to KAO Corporation. Novel polyol ether compounds, process preparing the compounds, and cosmetics comprising same. 4,576,967, Cl. 514-772.000.
USV Pharmaceutical Corp.: *See—*
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,576,941, Cl. 514-222.000.
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Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., to AGFA-Gevaert N.V. Method for transferring xerographic images. 4,576,889, Cl. 430-126.000.
Vahlensieck, Hans-Joachim: *See—*
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Valentini, Luigi; and Coccia, Mario, to Farmitalia Carlo Erba S.p.A. Safety device for connection of a syringe with the mouth or opening of a bottle containing a drug or a small tube for drug delivery from the syringe. 4,576,211, Cl. 141-329.000.
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Cadars, Patrick, 4,576,227, Cl. 165-149.000.
Loizeau, Pierre, 4,576,267, Cl. 192-70.170.
Valeria, Hidvegi, to Kozponti Valto-Es Hitelbank RT. Carcase, favorably furniture-carcase. 4,576,353, Cl. 248-165.000.
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Van Den Crommenacker, Johannes D. P.; and Lohstroh, Jan, to U.S. Philips Corporation. Integrated logic circuit having collector node with pull-up and clamp. 4,577,123, Cl. 307-446.000.
van der Lely, Cornelis. Tractor. 4,576,394, Cl. 280-490.00A.
Van der Togt, Jacobus C., to B.V. Haagse Bakkerijmachinefabriek. Apparatus for slicing bread products. 4,576,074, Cl. 83-358.000.
Van Dijck, Frans S. J.: *See—*
Harris, Richard J.; Pithouse, Kenneth B.; and Van Dijck, Frans S. J., 4,576,666, Cl. 156-85.000.
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Van Paradijs, Hendrikus J. A.; and Mynders, Gysbert J., to Multinorm B.V. Mowing device having improved drive and/or a crop separating drum. 4,575,997, Cl. 56-16.400.
Vartanov, Albert A.: *See—*
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Vasileff, Robert T.: *See—*
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Vasipari Kutato es Fejleszto Vallalat: *See—*
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Vaughn, Edward A.; and Clymin, Michael L., to C. H. Masland & Sons. Multi-layer pleated textile fiber product. 4,576,853, Cl. 428-181.000.
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Verbicky, John W., Jr.; and Colley, Alice M., to General Electric Company. Heterocyclic quaternary ammonium salts as phase transfer catalysts for aromatic ether imide preparation. 4,577,033, Cl. 548-461.000.
Verbruggen, Marcel, to Burndy Corporation. Zero insertion and extraction force connector. 4,576,427, Cl. 339-61.00M.
Vercon, Inc.: *See—*
Fortuna, Vincent E., 4,575,987, Cl. 53-298 000.
Verdier, Alain; and Charton, Gilbert, to Black & Decker Inc. Battery pack. 4,576,880, Cl. 429-99.000.
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Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,577,188, Cl. 340-721.000.
Sato, Kazuhiro; and Oguri, Katsuhiko, 4,577,250, Cl. 360-112.000.
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Watanabe, Yasuaki, 4,577,238, Cl. 358-340.000.
Vidal, Stephen P., Jr. Apparatus and method of creating and controlling an artificial water table. 4,576,511, Cl. 405-27.000.

Viehe, Heinz; Mesmaeker, Nadine S.; and Merenyi, Robert, to SOLVAY & Cie (Societe Anonyme). Polysubstituted dienes. 4,576,759, Cl. 260-410.90R.
Vietti, David E.: *See*—
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Villaveces, James; and Golden, Steven T. Cart for transporting shock sensitive loads, or unstable loads. 4,576,389, Cl. 280-43.160.
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Vitale, Ralph A. Safety closure for aerosol cans. 4,576,315, Cl. 222-153.000.
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Vollmer, Friedrich: *See*—
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von Bismarck, Gottfried, to W. R. Grace & Co., Cryovac Div. Shrink packaging process. 4,575,990, Cl. 53-434.000.
von Hahn, Hardwin E. A. Chlorination of copper, lead, zinc, iron, silver and gold. 4,576,812, Cl. 423-491.000.
Vos, Henry J. Combination outrigger stabilizer and lift axle for vehicles. 4,576,390, Cl. 280-43.230.
Voser, Walter: *See*—
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Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., 4,577,103, Cl. 250-316.100.
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von Bismarck, Gottfried, 4,575,990, Cl. 53-434.000.
W. S. Shamban & Company: *See*—
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W. Schlafhorst & Co.: *See*—
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Wagatsuma, Mitsuyoshi; Hatsuno, Susumu; Yamaguchi, Totaro; and Ohshima, Satoshi, to Tanabe Seiyaku Co., Ltd. Cephalosporin compound and process for preparing the same. 4,576,938, Cl. 514-206.000.
Wagenseil, Ludwig; and Lotter, Manfred, to Hydromatik GmbH. Swashplate axial piston pump. 4,576,554, Cl. 417-270.000.
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Walker, Frank A., Jr., to Geotel, Inc. Method and apparatus for plasma spray coating. 4,576,828, Cl. 427-34.000.
Walker, George A., to International Business Machines Corporation. Self-aligning mask. 4,576,832, Cl. 427-43.100.
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Walko, Ronald J.: *See*—
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Wallace Expanding Machines, Inc.: *See*—
Roper, Ralph E., 4,576,030, Cl. 72-296.000.
Wallace, William D.; and Cutler, Christopher A., to Utah Medical Products. Disposable pressure transducer apparatus for medical use. 4,576,181, Cl. 128-675.000.
Wallenfang, Gerd; and Glockner, Manfred, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection system for internal combustion engines. 4,576,129, Cl. 123-357.000.
Walter, Lothar: *See*—
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Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., to California Institute of Technology. Catalytic hollow spheres. 4,576,926, Cl. 502-339.000.
Ward, John W.; and Carlson, Timothy L., to Union Oil Company of California. Hydrocracking process and catalyst therefor. 4,576,711, Cl. 208-111.000.
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Hass, Robert H.; and Ward, John W., 4,576,814, Cl. 423-573.00G.
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Wittwer, Fritz; and Raible, Thomas, 4,576,284, Cl. 206-530.000.
Warner-Lambert Technologies, Inc.: *See*—
Carpenter, George J., 4,576,772, Cl. 264-154.000.
Warren, Theodore L.; Whelan, Kenneth R.; and Reinhold, Arnold G., to Automatix Incorporated. Vision system. 4,577,344, Cl. 382-1.000.
Wartian, George, to Wartian Lock Co. Door latch mechanism. 4,576,405, Cl. 292-191.000.
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Rasmussen, George P.; and Grimmett, Earl S., 4,576,102, Cl. 110-346.000.
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Watanabe, Masato; and Ozaki, Yuzo, to Toyo Tire & Rubber Company Limited. Magnetic coating composition. 4,576,726, Cl. 252-62.540.
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Watanabe, Tomohide, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic focusing apparatus for a semiconductor pattern inspection system. 4,577,095, Cl. 250-201.000.
Watanabe, Yasuaki, to Victor Company of Japan, Ltd. Circuit for reducing intermodulation distortion in a frequency-modulated signal. 4,577,238, Cl. 358-340.000.
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Weaver, David C. Jacket with sleeping bag. 4,575,876, Cl. 2-69.500.
Webb, Robert E.; Kreeft, Eugene H.; and Arnold, Jack T., to BBL Industries, Inc. Paging network. 4,577,050, Cl. 179-2.0EC.
Weber, Gunter, to Neimann S.A. Device for blocking the rotary movement of a steering column in a motor vehicle. 4,576,024, Cl. 70-252.000.
Weber, Joseph. Energy detection method and apparatus. 4,576,777, Cl. 376-153.000.
Weber, Paul S., to Exxon Research and Engineering Co. Bellows expansion joint. 4,576,404, Cl. 285-41.000.
Weber-Stephen Products Co.: *See*—
Schlosser, Erich J., 4,576,140, Cl. 126-25.00R.
Webster, Wilton W., Jr. Catheter for removing arteriosclerotic plaque. 4,576,177, Cl. 128-660.000.
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Wegehaupt, Karl-Heinrich: *See*—
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Weiner, Harvey I.; and Allard, Kenneth L., to United Technologies Corporation. Active clearance control. 4,576,547, Cl. 415-116.000.

Weiner, Maurice: *See—*
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Weirton Steel Corporation: *See—*
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Wells, John R., to Du Pont de Nemours, E. I., and Company. Rotor having a chamber block with an absorbant plug. 4,576,110, Cl. 118-52.000.
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Wenger, Hans. Panel unit. 4,575,982, Cl. 52-509.000.
Wenger, Otto, to Metacon Aktiengesellschaft. Apparatus for preventing air from contacting molten metal during discharge through a sliding closure unit. 4,576,317, Cl. 222-600.000.
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Wenzel, Michael D. Replaceable blade knife. 4,575,940, Cl. 30-335.000.
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, to Sanofi. Derivatives of 4-methyl 6-phenyl pyridazine active on the central nervous system. 4,576,946, Cl. 514-247.000.
Wescott, Kermit R.: *See—*
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Westebbe, Klaus: *See—*
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Boltrek, Henry; and Coakley, Peter J., Jr, 4,576,276, Cl. 198-332.000.
Braginski, Aleksander I.; and Male, Alan T., 4,575,927, Cl. 29-599.000.
Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., 4,577,281, Cl. 364-494.000.
Copper, Frank W., Jr.; and Castner, Raymond P., 4,576,546, Cl. 414-744.00R.
DeMario, Edmund E., 4,576,786, Cl. 376-439.000.
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Ferree, Herbert E.; Wagner, Thomas R.; Hecht, Michael D.; and Donnelly, Thomas J., 4,577,127, Cl. 310-83.000.
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Stol, Israel, 4,577,084, Cl. 219-85.00M.
Sweetana, Andrew S., 4,577,148, Cl. 324-72.000.
Westphal, Klaus, to Carl-Zeiss-Stiftung. Microscope tube having relatively swinging sections. 4,576,450, Cl. 350-522.000.
Wexler, Ruth R., to Du Pont de Nemours, E. I., and Company. Antihypertensive 4,5-diaryl-1H-imidazole-2-methanol derivatives. 4,576,958, Cl. 514-400.000.
Whelan, Kenneth R.: *See—*
Warren, Theodore L.; Whelan, Kenneth R.; and Reinhold, Arnold G., 4,577,344, Cl. 382-1.000.
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White, David D., Jr.: *See—*
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,576,767, Cl. 264-12.000.
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White, Steve R.: *See—*
Comerford, Liam D.; and White, Steve R., 4,577,289, Cl. 364-900.000.
White, William J., to Honeywell Inc. Method of fabricating a cold shield. 4,576,679, Cl. 156-644.000.
Whitlow, Graham A.: *See—*
Spengler, Charles J.; and Whitlow, Graham A., 4,576,874, Cl. 428-623.000.
Whitt, Roy E.: *See—*
Miller, Charles B.; and Whitt, Roy E., 4,576,709, Cl. 208-57.000.
Wick, Raymond V.: *See—*
Geary, Joseph M.; Vunck, Darius S.; Duneman, Dennis C.; Sessions, Ronald L.; Moeller, Charles E.; and Wick, Raymond V., 4,577,103, Cl. 250-316.100.
Wiegand, Richard J., to United States of America, Air Force. Electronic countermeasures false target system. 4,577,192, Cl. 343-18.00E.
Wieser, Karl-Heinz: *See—*
Oliver, Vincent S.; Tames, Walter; Prochaska, Helmuth H.; and Wieser, Karl-Heinz, 4,576,649, Cl. 106-308.00Q.
Wiley, Paris H.: *See—*
Manus, Eugene A.; and Wiley, Paris H., 4,576,179, Cl. 128-671.000.
Wilkes, Alan: *See—*
Golda, Eugene; and Wilkes, Alan, 4,576,892, Cl. 430-157.000.
Wilkinson, James H., to Sony Corporation. Digital video tape recorder apparatus. 4,577,241, Cl. 360-51.000.
Willett, Richard A.; Faletti, Fred J.; and Faletti, Paul A., to All-Pak, Inc. Method and apparatus for packaging garments. 4,575,986, Cl. 53-118.000.
William A. Barr Memorial Trust: *See—*
Barr, William A., 4,576,261, Cl. 192-4.00A.
Williams, Albert L.: *See—*
Chen, Catherine S. H.; and Williams, Albert L., 4,577,000, Cl. 525-534.000.
Williams, Annie J. Comfort collar. 4,576,169, Cl. 128-402.000.
Williams, Harold R., to Lift-U-Inc. Wheelchair passenger lift apparatus for transit stations. 4,576,539, Cl. 414-391.000.
Williford, Hugh S.: *See—*
Morgan, Annis R., Jr.; Mehlan, Bernd; Gress, Josef; and Williford, Hugh S., 4,576,272, Cl. 194-215.000.
Willits, Samuel P.: *See—*
Mohan, William L.; and Willits, Samuel P., 4,576,262, Cl. 192-18.00B.
Wilson, Harry B.: *See—*
Robinson, Michael; and Wilson, Harry B., 4,576,636, Cl. 75-1.00R.
Wilson, Ronald E. Flat panel display and method of manufacture. 4,577,133, Cl. 313-103.0CM.
Windecker, Robert J., to Nhy-Temp, Inc. Cryogenic refrigeration control system. 4,576,010, Cl. 62-64.000.
Winstanley, John P.: *See—*
Duncombe, Edward; and Winstanley, John P., 4,576,781, Cl. 376-247.000.
Winston, Walter E.; and Atkinson, Lowell G., to Black & Decker Inc. Painting applicator with remote supply. 4,576,553, Cl. 417-9.000.
Winterer, Wilfried: *See—*
Humpolik, Bohumil; Kluna, Vlastimil; Winterer, Wilfried; Kuchelmeister, Reinhold; and Bayer, Jurgen, 4,576,223, Cl. 165-79.000.
Wintershall AG: *See—*
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,576,513, Cl. 405-128.000.
Witbeck, Charles: *See—*
Rogak, Michael; Golan, Leonard W.; Witbeck, Charles; and Golan, Stephen L., 4,575,962, Cl. 42-1.00Q.
Wittwer, Fritz; and Raible, Thomas, to Warner-Lambert Company. Closing of filled capsules. 4,576,284, Cl. 206-530.000.
Wolf, Ronald J., to Wabash, Inc. Capacitor discharge ignition system with improved control circuit. 4,576,138, Cl. 123-600.000.
Wolfe, Henry S., to Swell-Wear, Inc. Air vent for an article. 4,576,087, Cl. 98-1.000.
Wolff, Danny K.: *See—*
Mott, James D.; and Wolff, Danny K., 4,576,358, Cl. 251-14.000.
Wolff, Leslie C. Athletic exerciser assembly. 4,576,377, Cl. 272-130.000.
Wolfhard, Dietrich: *See—*
Bechem, Werner; Peters, Hubertus; Solms, Jurgen; and Wolfhard, Dietrich, 4,576,684, Cl. 204-28.000.
Wong, Hee; and Chen, Carson, to National Semiconductor Corporation. Coherent data communications technique. 4,577,335, Cl. 375-86.000.
Wong, Thomas S. W., to Advanced Micro Devices, Inc. Compensation current generator. 4,577,296, Cl. 365-226.000.
Wong, Wah. Scaffolding system. 4,576,500, Cl. 403-49.000.

Woods, John W.; Kummli, Paul; and White, Edward M., to Storage Technology Partners II. Optical disk magnetic load/unload mechanism. 4,577,307, Cl. 369-270.000.

Wooldridge, James E.; Osborne, Robert E.; and Sexton, Robert W., to Allis-Chalmers Corporation. Self-cleaning collecting device. 4,576,618, Cl. 55-122.000.

Wootton, Malcolm J.; and Harris, Ivor R., to Lucas Industries Public Limited Company. Hydrogen storage material. 4,576,640, Cl. 75-123.00E.

Worner, Siegfried; Ottle, Walter; and Klein, Herbert, to J. Eberspacher. Filtering and post-combustion device for waste gases. 4,576,799, Cl. 422-176.000.

Worthington, Mark N. Skylight with a remotely operable light intensity reducing mechanism. 4,576,440, Cl. 350-258.000.

Wright, George: *See*—
McCaffrey, Ronald; Wright, George; and Baril, Earl F., 4,576,948, Cl. 514-274.000.

Wright, Michael T.: *See*—
Gould, Deryk S. M.; and Wright, Michael T., 4,577,128, Cl. 310-87.000.

Wright, Paul C.; and Gault, Robert. Collapsible container. 4,576,329, Cl. 229-41.00R.

Wright, Stuart C.: *See*—
Adams, Don L.; Evans, Charles W.; and Wright, Stuart C., 4,577,275, Cl. 364-433.000.

Wright, William B., Jr.: *See*—
Marsico, Joseph W., Jr.; Wright, William B., Jr.; and Press, Jeffery B., 4,576,957, Cl. 514-383.000.

Wright, William H., Jr.: *See*—
Levy, Stephen; O'Connell, Joseph C.; Wright, William H., Jr.; and Weiner, Maurice, 4,577,114, Cl. 250-551.000.

Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., to Massachusetts Institute of Technology. Production of hydrogen peroxide. 4,576,756, Cl. 260-396.00R.

Wrightson, Robert W.; and Colliver, Anthony D., to Coolair Corporation Pte. Ltd. Pulley mounting means. 4,576,505, Cl. 403-362.000.

Wrobel, Joseph J.: *See*—
Howe, Dennis G.; and Wrobel, Joseph J., 4,577,306, Cl. 369-109.000.

Wrobel, Raymond J.: *See*—
Tracy, Catherine O.; Binkerd, Evan F.; Rendek, Robert B.; and Wrobel, Raymond J., 4,576,825, Cl. 426-266.000.

Wuertz, Emil S., to Harvey Hubbell Incorporated. Power pole wiring assembly. 4,577,055, Cl. 174-48.000.

Wuerzer, Bruno: *See*—
Parg, Adolf; Hamprecht, Gerhard; Sauter, Hubert; and Wuerzer, Bruno, 4,576,630, Cl. 71-92.000.

Wursthorn, Karl R.: *See*—
Bresser, Robert E.; Mesch, Keith A.; and Wursthorn, Karl R., 4,576,984, Cl. 524-182.000.

Wuskell, Joseph P.: *See*—
Huffman, George W.; Pentz, William J.; Vietti, David E.; and Wuskell, Joseph P., 4,577,035, Cl. 549-472.000.

Wyler AG: *See*—
Stauber, Siegfried T., 4,575,947, Cl. 33-561.000.

Xerox Corporation: *See*—
Badesha, Santokh S.; Pai, Damodar M.; Carmichael, Kathleen M.; and Tarnawskyj, Ihor W., 4,576,634, Cl. 75-0.50A.
Beery, Jack; Donahue, Frederick A.; and Shaul, Ronald E., 4,577,096, Cl. 250-205.000.
Crean, Peter A.; Birnbaum, David; Feldman, David B.; Liptak, Frank J.; and Sewhuk, David W., 4,577,197, Cl. 346-75.000.
Lehman, Richard F., 4,576,462, Cl. 355-14.00R.
Silverberg, Morton, 4,576,461, Cl. 355-3.00R.
Smith, Henry E., 4,576,494, Cl. 400-175.000.

Xertex Corporation: *See*—
Takahashi, Yoshihiro; and Rey, Maria A., 4,577,338, Cl. 378-048.000.

Yabe, Hisao; Sasa, Hiroyuki; Nakajima, Yukio; Ishii, Fumiaki; Takamura, Koji; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Method of cleaning endoscope channels. 4,576,650, Cl. 134-22.120.

Yachigo, Shinichi: *See*—
Ishii, Tamaki; Yachigo, Shinichi; Sasaki, Manji; Shionoya, Masahisa; and Okamura, Haruki, 4,576,734, Cl. 252-404.000.

Yagi, Isaburo: *See*—
Morinaga, Akio; Sakaguchi, Yoichi; Hyodo, Masakatsu; and Yagi, Isaburo, 4,576,205, Cl. 138-98.000.

Yagi, Toshiharu: *See*—
Sako, Junichi; Yagi, Toshiharu; Higashihata, Yoshihide; Tatemoto, Masayoshi; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,577,005, Cl. 526-254.000.

Yamada, Akira: *See*—
Miura, Yuzo; and Yamada, Akira, 4,576,459, Cl. 354-287.000.

Yamada, Kouzi: *See*—
Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, 4,576,963, Cl. 514-532.000.

Yamada, Shigemichi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,576,063, Cl. 74-745.000.

Yamaguchi, Totaro: *See*—
Wagatsuma, Mitsuyoshi; Hatsuno, Susumu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,576,938, Cl. 514-206.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Sugiyama, Keiichi, 4,576,131, Cl. 123-432.000.

Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the transmission of a four-wheel drive vehicle. 4,576,061, Cl. 74-665.00T.

Yamamoto, Keiji: *See*—
Harada, Jumei; Yamamoto, Keiji; and Yokoi, Takashi, 4,576,563, Cl. 425-194.000.

Yamamoto, Takashi: *See*—
Kogane, Mikio; Nishimura, Mizuho; and Yamamoto, Takashi, 4,576,473, Cl. 355-68.000.

Yamamuro, Sigeaki: *See*—
Kumura, Haruyoshi; Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; and Yamamuro, Sigeaki, 4,576,265, Cl. 192-0.055.

Yaman, Melih: *See*—
Olsson, Olle G.; Yaman, Melih; Waldenstrom, Mats G.; and Fischer, Udo K. R., 4,576,875, Cl. 428-627.000.

Yamanobe, Sachio: *See*—
Sugano, Akira; Muramatsu, Masaru; Yamanobe, Sachio; and Sato, Yoshio, 4,577,270, Cl. 364-151.000.

Yamaoka, Keijiro, to Mitsui Engineering & Shipbuilding Co., Ltd. Geothermal hot water transportation and utilization system. 4,576,006, Cl. 60-641.500.

Yamasaki, Masahiro; Hirose, Iwao; Fukushima, Masao; and Yoshida, Ichiro, to Dainippon Screen Mfg. Co., Ltd. Liquid developing apparatus. 4,576,467, Cl. 355-10.000.

Yamato, Akihiro; and Otobe, Yutaka, to Honda Giken Kogyo K.K. Fuel supply control method for internal combustion engines capable of improving accelerability of the engine from an idling region thereof. 4,576,134, Cl. 123-480.000.

Yamato, Yoshiharu, to Kohtaki & Co., Ltd. Uniform-pressure press apparatus. 4,576,092, Cl. 100-218.000.

Yamatsu, Isao; Abe, Shinya; Inai, Yuichi; Suzuki, Takeshi; Kinoshita, Kensaku; Mishima, Mannen; Katoh, Yoshinori; Kobayashi, Seiichi; Murakami, Manabu; and Yamada, Kouzi, to Eisai Co., Ltd. Polyprenyl compounds, process for the production thereof and medicines containing same. 4,576,963, Cl. 514-532.000.

Yamauchi, Teruo; Nogi, Toshiharu; and Oyama, Yoshishige, to Hitachi, Ltd. Fuel dispenser for internal combustion engine. 4,576,136, Cl. 123-590.000.

Yamaura, Mitsuru, to Kabushiki Kaisha Toshiba. Protective relay system. 4,577,254, Cl. 361-80.000.

Yamawaki, Naokuni: *See*—
Kuroda, Toru; and Yamawaki, Naokuni, 4,576,927, Cl. 502-402.000.

Yamazaki, Shiro: *See*—
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Yanagishima, Fumiya: *See*—
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Yanmar Diesel Engine Co., Ltd.: *See*—
Tanaka, Mitsuo, 4,576,137, Cl. 123-575.000.

Yashima, Michio: *See*—
Nakazawa, Masao; Yashima, Michio; and Takahashi, Shuuji, 4,576,879, Cl. 429-86.000.

Yasumoto, Hidetoshi: *See*—
Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse, Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, 4,576,470, Cl. 355-38.000.

Yasumoto, Taizo: *See*—
Murata, Shouichi; Makiyama, Muneto; Omoto, Takahiro; and Yasumoto, Taizo, 4,576,840, Cl. 428-16.000.

Yasunishi, Akira: *See*—
Kamei, Futoshi; Harada, Shinichi; Yasunishi, Akira; Takemura, Minoru; Fujikawa, Takeshi; Iida, Shinzo; and Katayama, Yasuyuki, 4,577,277, Cl. 364-472.000.

Yaverbaum, Sidney; and Kusnetz, Jacob, to Technicon Instruments Corporation. Fluoroimmunoassaying. 4,576,912, Cl. 435-7.000.

Yeung, Anthony C. Method of sampling and analyzing biocidal gas from a reaction chamber. 4,576,918, Cl. 436-179.000.

Yoda, Yasutada; Sueyasu, Seisuke; Orikawa, Michihiro; and Futamura, Shoji, to Bridgestone Tire Co. Ltd.; and Institute of Technology Precision Electrical Discharge Works. Vented tire molding mold. 4,576,559, Cl. 425-28.00R.

Yokogawa Medical Systems, Limited: *See*—
Ogawa, Yoshiyuki; Uno, Hideaki; and Baba, Misao, 4,576,368, Cl. 269-322.000.

Yokoi, Takashi: *See*—
Harada, Jumei; Yamamoto, Keiji; and Yokoi, Takashi, 4,576,563, Cl. 425-194.000.

Yokota, Shoichiro: *See*—
Doi, Isao; Mihashi, Takashi; and Yokota, Shoichiro, 4,576,127, Cl. 123-90.150.

Yoneda, Yosuke, to Tomy Kogyo Co., Inc. Toy capable of executing multiple moving modes. 4,576,583, Cl. 446-94.000.

Yonkers, Edward H.: *See*—
McCreedy, Kathleen M.; Keskkula, Henno; Pawloski, James C.; and Yonkers, Edward H., 4,576,721, Cl. 210-640.000.

Yoshida, Akiyoshi; Kametaka, Shigeru; and Hayashi, Shin'ichi, to Rohto Pharmaceutical Co., Ltd. Method for enhancing a fungus-lytic activity of beta-1,3-D-glucanase. 4,576,914, Cl. 435-42.000.

Yoshida, Fumio; and Kotera, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Rolling mill. 4,576,027, Cl. 72-11.000.

Yoshida, Ichiro: *See*—
Yamasaki, Masahiro; Hirose, Iwao; Fukushima, Masao; and Yoshida, Ichiro, 4,576,467, Cl. 355-10.000.

Yoshida, Kenichi: *See—*
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Yoshida Kogyo K. K.: *See—*
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Yoshida, Takao: *See—*
Hall, John B.; and Yoshida, Takao, 4,576,186, Cl. 131-276.000.
Hall, John B.; and Yoshida, Takao, 4,576,740, Cl. 252-522.00R.

Yoshida, Toshio: *See—*
Sugiuchi, Toshiyasu; Aoyama, Susumu; and Yoshida, Toshio, 4,575,913, Cl. 29-432.000.

Yoshikawa, Kuniyuki: *See—*
Saiki, Kazuaki; Ishikawa, Aiichi; Hashimoto, Noriyoshi; Kudo, Koichi; and Yoshikawa, Kuniyuki, 4,577,141, Cl. 318-590.000.

Yoshikawa, Shoji; and Sakamoto, Masaharu, to Olympus Optical Co., Ltd. Light power controlling apparatus. 4,577,320, Cl. 372-29.000.

Yoshimoto, Shinji: *See—*
Mizukura, Noboru; Fujimori, Noboru; Masuda, Kosaku; Yoshimoto, Shinji; Tachibana, Noriki; and Ueda, Eiichi, 4,576,911, Cl. 430-548.000.

Yoshimura, Yutaka; and Hikami, Masahiro, to Sharp Kabushiki Kaisha. Solar energy-powered calculator or the like. 4,577,286, Cl. 364-708.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Tahara, Tetsuya; Ikebe, Tsuguo; Terasawa, Michio; and Imayoshi, Tomonori, 4,576,940, Cl. 514-212.000.

Young, Hartley F., to Ralph McKay Limited. Cast shoulder. 4,576,334, Cl. 238-310.000.

Youssef, Kamal A. Toothsticks "Toostix". 4,576,190, Cl. 132-89.000.

Youssefyeh, Raymond D., to USV Pharmaceutical Corp. Anti-allergic and anti-inflammatory bi- and tri- cyclo-1,4-thiazine derivatives, composition, and method of use therefor. 4,576,942, Cl. 514-222.000.

Yu, I-Ping, to Hughes Aircraft Company. Missile mounted waveguide antenna. 4,577,196, Cl. 343-705.000.

Yuasa, Yoshio; Yasumoto, Hidetoshi; Naruse. Kazuhiko; Kawagoe, Nobukazu; and Inaba, Masahito, to Minolta Camera Kabushiki Kaisha. Enlarger for use in photography. 4,576,470, Cl. 355-38.000.

Yungblut, Glen R.: *See—*
Cooke, William J.; Dancey, James N.; DeBoon, George B.; Miller, Norman W.; and Yungblut, Glen R., 4,576,518, Cl. 405-205.000.

Zabriskie, Dane W.: *See—*
MacBride, William R.; Magee, James A.; Armiger, William B.; and Zabriskie, Dane W., 4,577,110, Cl. 250-461.200.

Zafar, Magbool A.: *See—*
McDermott, Charles; and Zafar, Magbool A., 4,575,976, Cl. 52-118.000.

Zagorski, Joseph; and Finnieston, Alan. Bowed upper arm brace. 4,576,153, Cl. 128-87.00R.

Zahler, Robert; Koster, William H.; and Slusarchyk, William A., to E. R. Squibb & Sons, Inc. 3-Acylamino-1-carboxymethylaminocarbonyl-2-azetidinones. 4,576,749, Cl. 260-239.00A.

Zahnraderfabrik Renk, A.G.: *See—*
Reppert, Rudi; Zaunberger, Franz X.; and Kugler, Artur, 4,576,062, Cl. 74-740.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai (Microbial Chemistry Research Foundation): *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,576,931, Cl. 514-30.000.

Zanin, Michael A., to AMCA International Corporation. Crane for nuclear waste handling facilities. 4,576,100, Cl. 105-49.000.

Zaunberger, Franz X.: *See—*
Reppert, Rudi; Zaunberger, Franz X.; and Kugler, Artur, 4,576,062, Cl. 74-740.000.

Zbinden, Terry B., to Sperry Corporation. Detection of catastrophic failure of dielectric, improper connection, and temperature of a printed circuit assembly via one wire. 4,577,149, Cl. 324-73.0PC.

Zeigner, Willard L.; and MacIntosh, John A., to Zemco, Inc. Dieter's weighing scale. 4,576,244, Cl. 177-245.000.

Zemco, Inc.: *See—*
Zeigner, Willard L.; and MacIntosh, John A., 4,576,244, Cl. 177-245.000.

Ziebold, Steven A.: *See—*
McAlister, Donald R.; and Ziebold, Steven A., 4,576,813, Cl. 423-522.000.

Zierhut, Kurt P.: *See—*
Haas, Gene F.; and Zierhut, Kurt P., 4,576,530, Cl. 409-223.000.

Zigman, Donald J. Grip hanger. 4,576,290, Cl. 211-34.000.

Zima, John P. Device for fighting fires in highrise buildings and towers. 4,576,249, Cl. 182-82.000.

Zimmerer, Wilhelm: *See—*
Mathis, Paul; Mathis, Bernhard; Mathis, Franz; and Zimmerer, Wilhelm, 4,576,483, Cl. 366-65.000.

Zimmermann, Heinrich. Test equipment for phono pickup needles. 4,577,303, Cl. 369-55.000.

Ziyad Incorporated: *See—*
Staniszewski, Tadeusz, 4,576,493, Cl. 400-175.000.

Zuccaro, Don R., to Board of Regents, University of Texas System. Method and apparatus for establishing a reference potential on satellites in planetary ionospheres. 4,576,348, Cl. 244-173.000.

Zullig AG Rheineck: *See—*
Chiusole, Erwin; and Zullig, Hans, 4,576,704, Cl. 204-402.000.

Zullig, Hans: *See—*
Chiusole, Erwin; and Zullig, Hans, 4,576,704, Cl. 204-402.000.

Zygo Corporation: *See—*
Soobitsky, James A., 4,577,131, Cl. 310-328.000.

501 Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Barazeche, Bahman; Alexis, Roger P. J.; and Guidoux, Loic B. Y., 4,577,309, Cl. 370-32.000.

501 Vickers PLC: *See—*
McCann, James; Langley, James; Hopper, Ian; Durham, Steven; Scott, Thomas; and McOmish, Eric R., 4,576,517, Cl. 405-195.000.

501 W B Lock Company: *See—*
Holden, Kenneth M., 4,576,021, Cl. 70-34.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MARCH, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Davis, William G., to Liquid Modulators, Inc. Liquid modulator. Re. 32,092, Cl. 62-475.000.

General Electric Company: *See*—
Hale, Thomas E., Re. 32,093, Cl. 428-336.000.

Hale, Thomas E., to General Electric Company. Aluminum oxide coated titanium-containing cemented carbide product. Re. 32,093, Cl. 428-336.000.

Liquid Modulators, Inc.: *See*—
Davis, William G., Re. 32,092, Cl. 62-475.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Taylor, Glenn. Rotary dump. B1 4,077,328, 3-18-86, Cl. 105-261.00A.

LIST OF DESIGN PATENTEES

A/S E. Damberg Group: *See*—
Skillius, Hans, 283,074, Cl. D34-40.000.

ABC Industries, Inc.: *See*—
Yokers, Henry P.; and Conley, Janet M., 283,070, Cl. D34-15.000.

Abe, Karl H.; and Gevert, Klaus V., to Bayerische Motoren Werke AG. Fairing for motorcycles. 283,021, 3-18-86, Cl. D12-182.000.

Acme United Corporation: *See*—
Sharkany, Edward J., 283,048, Cl. D24-26.000.

Altman, Charles W. C., to Altman Stage Lighting Co., Inc. Rotatable detachable head for weather resistant spot light. 283,054, 3-18-86, Cl. D26-24.000.

Altman Stage Lighting Co., Inc.: *See*—
Altman, Charles W. C., 283,054, Cl. D26-24.000.

American Home Products Corporation (Del.): *See*—
Godsey, James H., 283,050, Cl. D24-31.000.

American Motors Corporation: *See*—
Teague, Richard A.; Nixon, Robert C.; and Krispinsky, George M., 283,019, Cl. D12-163.000.

Amiet AG: *See*—
Gisiger, Urs, 283,005, Cl. D8-331.000.

Anders Eriksson HB: *See*—
Eriksson, Anders, 283,047, Cl. D24-10.000.

Anheuser-Busch Companies, Inc.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Traczyk, Edward S.; Shulski, Michael M.; Cassidy, Edward K.; and Mann, John M., 283,011, Cl. D9-398.000.

Ansems, Henricus J. Lamp. 283,056, 3-18-86, Cl. D26-61.000.

AT&T Information Systems, Inc.: *See*—
Gaus, Gary R.; McGarvey, John N.; Reeves, John P.; and Tilley, Alvin R., 283,025, Cl. D14-63.000.

AT&T Technologies, Inc.: *See*—
McGarvey, John N.; and Tilley, Alvin R., 283,024, Cl. D14-60.000.

Bart, Rick. Side chair. 282,983, 3-18-86, Cl. D6-369.000.

Bart, Rick. Side chair. 282,984, 3-18-86, Cl. D6-369.000.

Bartlett, Randall N., to Syntex (U.S.A.) Inc. Combined cup and towel dispenser. 282,992, 3-18-86, Cl. D6-516.000.

Bayerische Motoren Werke AG: *See*—
Abe, Karl H.; and Gevert, Klaus V., 283,021, Cl. D12-182.000.

Beal, Albert R. Strigil. 283,068, 3-18-86, Cl. D32-49.000.

Beattie Systems, Inc.: *See*—
Sadre-Marandi, Ehsan; and Smith, Harry L. O., 283,031, Cl. D16-44.000.

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CLASS 34

10 4,575,948
14 4,575,949
27 4,575,950
30 4,575,951
54 4,575,952

CLASS 36

77 R 4,575,953
89 4,575,954
117 4,575,955
119 4,575,956
121 4,575,957
4,575,958

CLASS 37

4 4,575,959
63 4,575,960

CLASS 42

1 Q 4,575,962
1 S 4,575,961
70 F 4,575,963
94 4,575,964

CLASS 49

50 4,575,965
209 4,575,966
211 4,575,967
502 4,575,968

CLASS 51

131.1 4,575,969
165.92 4,575,970
170 TL 4,575,973
236 4,575,971
251 4,575,972
295 4,576,612

CLASS 52

24 4,575,979
86 4,575,974
109 4,575,975
118 4,575,976
169.3 4,575,977
234 4,575,978
291 4,575,980
309.9 4,575,981
509 4,575,982
544 4,575,983
589 4,575,984
677 4,575,985

CLASS 53

118 4,575,986
298 4,575,987
399 4,575,988
434 4,575,989
4,575,990
509 4,575,991
520 4,575,992
534 4,575,993
582 4,575,994
591 4,575,995

CLASS 54

80 4,575,996

CLASS 55

1 4,576,613
18 4,576,614
43 4,576,615
68 4,576,616
96 4,576,617
122 4,576,618
213 4,576,619

CLASS 56

16.4 4,575,997
312 4,575,998

CLASS 57

333 4,575,999
416 4,576,000

CLASS 60

39.08 4,576,001
262 4,576,002
384 4,576,003
547.1 4,576,004
618 4,576,005
641.5 4,576,006
660 4,576,007
662 4,576,008

CLASS 62

3 4,576,009
64 4,576,010
115 4,576,011
157 4,576,012
171 4,576,013
268 4,576,014
292 4,576,015
320 4,576,016
372 4,576,017
475 Re.32,092

CLASS 65

9 4,576,620
10.2 4,576,621
13 4,576,622
30.14 4,576,623
300 4,576,624

CLASS 66

106 4,576,018
147 4,576,019

CLASS 68

205 R 4,576,020

CLASS 70

34 4,576,021
55 4,576,022
137 4,576,023
252 4,576,024
276 4,576,025
380 4,576,026

CLASS 71

3 4,576,625
28 4,576,626
41 4,576,627
88 4,576,628
90 4,576,629
92 4,576,630
4,576,631
93 4,576,632
4,576,633

CLASS 72

11 4,576,027
143 4,576,028
205 4,576,029
296 4,576,030
355 4,576,031
431 4,576,032
469 4,576,033

CLASS 73

1 DV 4,576,034
4 R 4,576,035
29 4,576,036
40.5 R 4,576,037
40.7 4,576,038
118 4,576,039
146 4,576,040
151 4,576,041
155 4,576,042
195 4,576,043
462 4,576,044
597 4,576,047
626 4,576,045
631 4,576,046
642 4,576,048
706 4,576,049
861.05 4,576,050
862.36 4,576,051
862.63 4,576,052
862.66 4,576,053
863.03 4,576,054

CLASS 74

200 4,576,055
388 PS 4,576,056
424.8 C 4,576,057
425 4,576,058
473 P 4,576,059
573 R 4,576,060
665 T 4,576,061
740 4,576,062
745 4,576,063
833 4,576,064
866 4,576,065

CLASS 75

0.5 A 4,576,634
0.5 AA 4,576,635
1 R 4,576,636
10 R 4,576,637
80 4,576,638
123 E 4,576,639
4,576,640
128 P 4,576,641
239 4,576,642

CLASS 81

176.3 4,576,066
185.1 4,576,067

CLASS 82

1.4 4,576,068
2 R 4,576,069
82 4,576,070

CLASS 83

71 4,576,071
102.1 4,576,072
4,576,073
358 4,576,074
464 4,576,075
471.3 4,576,076
816 4,576,077
833 4,576,078
886 4,576,079

CLASS 84

267 4,576,080

CLASS 87

6 4,576,081

CLASS 89

8 4,576,082
14.4 4,576,083
4,576,084
36.13 4,576,085
43.01 4,576,086

CLASS 98

1 4,576,087
119 4,576,088

CLASS 99

332 4,576,089
443 C 4,576,090
455 4,576,091

CLASS 100

218 4,576,092

CLASS 102

200 4,576,093
202.12 4,576,094

CLASS 104

12 4,576,095
94 4,576,096
138 G 4,576,097
172 B 4,576,098
287 4,576,099

CLASS 105

49 4,576,100
261 A B1 4,077,328

CLASS 106

14.24 4,576,643
100 4,576,644
125 4,576,645
163.1 4,576,646
193 R 4,576,647
269 4,576,648
308 Q 4,576,649

CLASS 110

182.5 4,576,101
346 4,576,102

CLASS 112

73 4,576,103
265.2 4,576,104

CLASS 114

333 4,576,105

CLASS 116

63 R 4,576,106
227 4,576,107

CLASS 118

19 4,576,108
50 4,576,109
52 4,576,110
313 4,576,111
415 4,576,112
697 4,576,113
720 4,576,114

CLASS 119

5 4,576,115
19 4,576,116
52 B 4,576,117
62 4,576,118
81 4,576,119

CLASS 122

6 A 4,576,120
7 R 4,576,121
26 4,576,122
382 4,576,123
406 ST 4,576,124
483 4,576,125

CLASS 123

41.38 4,576,126
90.15 4,576,127
198 F 4,576,128
357 4,576,129
372 4,576,130
432 4,576,131
438 4,576,132
458 4,576,133
480 4,576,134
490 4,576,135
575 4,576,137
590 4,576,136
600 4,576,138

CLASS 125

21 4,576,139

CLASS 126

25 R 4,576,140
120 4,576,141

CLASS 128

1 D 4,576,142
1 R 4,576,143
4 4,576,144
6 4,576,145
4,576,146
4,576,147
26 4,576,148
33 4,576,149
75 4,576,150
78 4,576,154
80 C 4,576,151
87 R 4,576,153
92 R 4,576,152
4,576,158
132 R 4,576,155
4,576,156
200.23 4,576,157
203.14 4,576,159
303 R 4,576,161
4,576,162
303.1 4,576,160
305 4,576,163
4,576,164
4,576,165
325 4,576,166
334 R 4,576,167
342 4,576,168
402 4,576,169
419 D 4,576,170
421 4,576,171
422 4,576,172
633 4,576,173
639 4,576,174
660 4,576,175
4,576,176
4,576,177
670 4,576,178
671 4,576,179
673 4,576,180
675 4,576,181
692 4,576,182
723 4,576,183
733 4,576,184
760 4,576,185

CLASS 131

276 4,576,186
336 4,576,187

CLASS 132

39 4,576,188
53 4,576,189
89 4,576,190

CLASS 134

22.12 4,576,650
25.1 4,576,651

CLASS 135

30 4,576,191
89 4,576,192

CLASS 136

244 4,577,051
246 4,577,052

CLASS 137

15 4,576,193
84 4,576,194
315 4,576,195
508 4,576,196
565 4,576,197
596 4,576,198
614.04 4,576,199
624.13 4,576,200
624.18 4,576,201
625.17 4,576,202
625.63 4,576,203

CLASS 138

44 4,576,204
98 4,576,205
149 4,576,206
177 4,576,207

CLASS 139

429 4,576,208

CLASS 141

1 4,576,209
115 4,576,210
329 4,576,211

CLASS 144

243 4,576,212
371 4,576,213

CLASS 148

1.5 4,576,652
3 4,576,653
11.5 F 4,576,654
12 C 4,576,656
4,576,657
12 F 4,576,655
111 4,576,658
127 4,576,659
407 4,576,660

CLASS 152

213 A 4,576,214

CLASS 156

48 4,576,661
52 4,576,662
64 4,576,663
71 4,576,664
72 4,576,665
83 4,576,666
89 4,576,667
93 4,576,668
145 4,576,669
177 4,576,672
219 4,576,670
245 4,576,671
350 4,576,673
463 4,576,674
468 4,576,675
603 4,576,676
642 4,576,677
643 4,576,678
644 4,576,679

CLASS 162

158 4,576,680
301 4,576,681
358 4,576,682

CLASS 164

15 4,576,215
21 4,576,216
66.1 4,576,220
130 4,576,217
355 4,576,219
431 4,576,218

CLASS 165

49 4,576,221
76 4,576,222
79 4,576,223
80.2 4,576,224
101 4,576,225
134.1 4,576,226
149 4,576,227
162 4,576,228

CLASS 166

177 4,576,229
248 4,576,231
274 4,576,232
297 4,576,233
319 4,576,234
374 4,576,235
382 4,576,230
386 4,576,236

CLASS 169

53 4,576,237

CLASS 172

311 4,576,238
751 4,576,239

CLASS 173

105 4,576,240
162 H 4,576,241

CLASS 174

7 4,577,053
35 C 4,577,054
48 4,577,055
52 FP 4,577,056

CLASS 175

107 4,576,242

CLASS 177

119 4,576,243
245 4,576,244

CLASS 178

18 4,577,057
4,577,058
22.17 4,577,059

CLASS 179

2 A 4,577,062
2 AM 4,577,061
2 EC 4,577,060
6.16 4,577,063
16 F 4,577,064
18 B 4,577,066
18 BC 4,577,065
99 H 4,577,067
100 R 4,577,068
119 R 4,577,069
146 R 4,577,070
170.2 4,577,071
175.1 R 4,577,072

CLASS 180

14.1 4,576,245
168 4,576,246

CLASS 181

243 4,576,247

CLASS 182

5 4,576,248
82 4,576,249
108 4,576,250
152 4,576,251

CLASS 185

39 4,576,252

CLASS 187

29 R 4,576,253

CLASS 188

67 4,576,254
71.5 4,576,255
71.6 4,576,256
73.32 4,576,257
299 4,576,258

CLASS 192

0.044 4,576,263
0.055 4,576,265
3.21 4,576,259
3.31 4,576,260
4 A 4,576,261
18 B 4,576,262
48.91 4,576,264
70.12 4,576,266
70.17 4,576,267
98 4,576,268
103 A 4,576,269
150 4,576,270

CLASS 194

203 4,576,275
209 4,576,273
210 4,576,274
215 4,576,272
233 4,576,271

CLASS 198

332 4,576,276
803.01 4,576,277

CLASS 200

148 A 4,577,072
4,577,074
148 R 4,577,075
294 4,577,076

CLASS 203

15 4,576,683

CLASS 204

20 4,576,689
28 4,576,684
30 4,576,685
33 4,576,686
67 4,576,690
129.3 4,576,691
157.5 4,576,687
157.62 4,576,688
165 4,576,692
180.1 4,576,693
181.1 4,576,694
181.4 4,576,695
182.6 4,576,696
192 E 4,576,698
192 M 4,576,699
4,576,700
192 N 4,576,697
280 4,576,701
299 R 4,576,702
4,576,703
402 4,576,704
406 4,576,705
409 4,576,706

CLASS 206

204 4,576,278
225 4,576,279
289 4,576,280
370 4,576,281
524 4,576,282
524.8 4,576,283
530 4,576,284
632 4,576,285

CLASS 208

8 LE 4,576,707
11 LE 4,576,708
57 4,576,709
58 4,576,710
111 4,576,711
138 4,576,712

CLASS 209

254 4,576,713
558 4,576,286
601 4,576,287
609 4,576,288
631 4,576,289

CLASS 210

195.1 4,576,714
347 4,576,715
496 4,576,716
610 4,576,717
616 4,576,718
620 4,576,719
626 4,576,720
640 4,576,721
699 4,576,722
709 4,576,723
788 4,576,724
801 4,576,765

CLASS 211

34 4,576,290
49.1 4,576,291
4,576,292
127 4,576,293

CLASS 213

9 4,576,294
32 R 4,576,295

CLASS 215

31 4,576,296
250 4,576,297
252 4,576,298
318 4,576,299

CLASS 217

13 4,576,300

CLASS 219

10.43 4,577,077
10.55 A 4,577,078
10.55 D 4,577,079
10.55 E 4,577,080
10.69 4,577,081
69 D 4,577,082
85 F 4,577,083
85 M 4,577,084
116 4,577,085
117.1 4,577,086
121 LC 4,577,087
121 LD 4,577,088
124.22 4,577,089
137.9 4,577,090
284 4,577,091
354 4,577,092
376 4,577,093
505 4,577,094

CLASS 220

1 C 4,576,301
3.5 4,576,302
89 A 4,576,303
269 4,576,304
4,576,305
271 4,576,306
324 4,576,307
327 4,576,308
366 4,576,309
404 4,576,310

CLASS 221

73 4,576,311

CLASS 222

27 4,576,312
81 4,576,313
97 4,576,314
153 4,576,315
541 4,576,316
600 4,576,317

CLASS 223

52 4,576,318

CLASS 224

42.41 4,576,319
311 4,576,320

CLASS 225

104 4,576,380

CLASS 226

173 4,576,321

CLASS 228

4.5 4,576,322
29 4,576,323
44.3 4,576,324
135 4,576,325
171 4,576,326
212 4,576,327

CLASS 229

1.5 R 4,576,328
41 R 4,576,329
44 R 4,576,330

CLASS 236

49 4,576,331

CLASS 237

2 B 4,576,332
49 4,576,333

CLASS 238

310 4,576,334

CLASS 239

1 4,576,335
33 4,576,336
127 4,576,337
452 4,576,338

CLASS 241

120 4,576,339

CLASS 242

35.5 A 4,576,340
4,576,341
36 4,576,342
66 4,576,343
67.1 R 4,576,344
198 4,576,345

CLASS 244

3.16 4,576,346
130 4,576,347
173 4,576,348

CLASS 248

27.1 4,576,349
97 4,576,350
118 4,576,351
165 4,576,353
188.4 4,576,352
354.5 4,576,354
544 4,576,355
559 4,576,356
662 4,576,357

CLASS 250

201 4,577,095
205 4,577,096
211 K 4,577,097
216 4,577,098
4,577,099
231 P 4,577,100
231 SE 4,577,101
269 4,577,102
316.1 4,577,103
339 4,577,104
343 4,577,105
347 4,577,106
363 S 4,577,107
370 4,577,108
461.1 4,577,109
461.2 4,577,110
492.2 4,577,111
506.1 4,577,112
548 4,577,113
551 4,577,114
578 4,577,115

CLASS 251

14 4,576,358
149.6 4,576,359
162 4,576,360

CLASS 252

62.51 4,576,725
62.54 4,576,726
90 4,576,727
102 4,576,728
106 4,576,729
174.14 4,576,730
182 4,576,731
299.65 4,576,732
299.67 4,576,733
404 4,576,734
512 4,576,735
4,576,736
522 A 4,576,737
522 R 4,576,739
4,576,740
4,576,741
4,576,742
524 4,576,743
554 4,576,744
559 4,576,738

CLASS 254

26 R 4,576,361
134.3 FT 4,576,362
372 4,576,363

CLASS 256

24 4,576,364

CLASS 260

112.5 R 4,576,745
239 A 4,576,746
4,576,747
4,576,748
4,576,749
4,576,753
239.3 D 4,576,750
245.2 R 4,576,754
245.4 4,576,751
245.78 4,576,755
349 4,576,752
396 R 4,576,756
404.5 4,576,757
405.5 4,576,758
410.9 R 4,576,759

CLASS 261

23 A 4,576,761
65 4,576,762
94 4,576,763
111 4,576,764

CLASS 264

1.4 4,576,766
12 4,576,767
27 4,576,768
51 4,576,769
103 4,576,770
109 4,576,771
154 4,576,772
167 4,576,773
267 4,576,774
323 4,576,775
510 4,576,776

CLASS 266

220 4,576,365

CLASS 267

8 R 4,576,366

CLASS 269

32 4,576,367
322 4,576,368

CLASS 270

54 4,576,369
4,576,370

CLASS 271

296 4,576,371

CLASS 272

41 4,576,373
52.5 4,576,374
65 4,576,375
69 4,576,376
130 4,576,377
146 4,576,372

CLASS 273

186 A 4,576,378
411 4,576,379

CLASS 277

1 4,576,381
12 4,576,382
53 4,576,383
81 S 4,576,384
124 4,576,385
165 4,576,386
176 4,576,387

CLASS 280

33.99 F 4,576,388
43.16 4,576,389
43.23 4,576,390
79.1 R 4,576,391
87.02 W 4,576,392
276 4,576,393
490 A 4,576,394
511 4,576,395
612 4,576,396
625 4,576,397
789 4,576,398

CLASS 282

8 R 4,576,399

CLASS 285

5 4,576,400
15 4,576,401
39 4,576,402
4,576,403
41 4,576,404

CLASS 290

43 4,577,116

CLASS 292

191 4,576,405

CLASS 294

86.41 4,576,406
97 4,576,407
99.2 4,576,408

CLASS 296

97 H 4,576,409

CLASS 297

284 4,576,410
353 4,576,411
362 4,576,412
408 4,576,413
476 4,576,414

CLASS 301

37 S 4,576,415

CLASS 303

15 4,576,416
4,576,417
71 4,576,418
100 4,576,419

CLASS 307

10 R 4,577,117
106 4,577,118
297 4,577,119
355 4,577,121
425 4,577,122
446 4,577,123
451 4,577,124
455 4,577,125

CLASS 308

6 C 4,576,420
4,576,421
4,576,422

CLASS 310

52 4,577,126
83 4,577,127
87 4,577,128
112 4,577,129
194 4,577,130
328 4,577,131
800 4,577,132

CLASS 312

216 4,576,423
231 4,576,424
324 4,576,425

CLASS 313

103 CM 4,577,133
346 R 4,577,134
362.1 4,577,135
481 4,577,136
533 4,577,137
599 4,577,138

CLASS 318

254 4,577,139
587 4,577,140
590 4,577,141
592 4,577,142
701 4,577,143

CLASS 320

2 4,577,144
4,577,145

CLASS 323

341 4,577,146

CLASS 324

71.3 4,577,147
72 4,577,148
73 PC 4,577,149
83 R 4,577,150
158 MG 4,577,151
309 4,577,152
334 4,577,153

CLASS 328

158 4,577,154
164 4,577,155
237 4,577,156

CLASS 329

50 4,577,157
104 4,577,158

CLASS 330

9 4,577,159
149 4,577,160
4,577,161
253 4,577,162

CLASS 331

1 A 4,577,163
109 4,577,164
4,577,165

CLASS 332

9 T 4,577,166

CLASS 333

128 4,577,167
170 4,577,168
194 4,577,169
205 4,577,170

CLASS 334

1 4,577,171

CLASS 335

80 4,577,172
4,577,173
261 4,577,174

CLASS 336

61 4,577,175

CLASS 337

394 4,577,176

CLASS 339

17 F 4,576,426
61 M 4,576,427
94 R 4,576,428
95 D 4,576,429
100 4,576,430
131 4,576,431

CLASS 340

19 R 4,577,177
81 R 4,577,178
309.15 4,577,179
347 DD 4,577,180
522 4,577,181
539 4,577,182
541 4,577,183
566 4,577,184
573 4,577,185
589 4,577,186
700 4,577,187
721 4,577,188
794 4,577,189
825.79 4,577,191
825.83 4,577,190

CLASS 343

18 E 4,577,192
380 4,577,193
401 4,577,194

702 4,577,195
705 4,577,196

CLASS 346

75 4,577,197
76 PH 4,577,198
4,577,199
139 R 4,577,206
140 R 4,577,200
4,577,201
4,577,202
4,577,203
200 4,577,204
204 4,577,205

CLASS 350

1.2 4,576,432
3.64 4,576,434
4.1 4,576,433
96.10 4,576,436
96.20 4,576,437
96.26 4,576,435
96.34 4,576,438
162.23 4,576,439
258 4,576,440
355 4,576,441
418 4,576,442
427 4,576,443
4,576,445
428 4,576,444
429 4,576,446
444 4,576,447
465 4,576,448
500 4,576,449
522 4,576,450
566 4,576,451
620 4,576,452

CLASS 351

162 4,576,453
243 4,576,454

CLASS 352

78 R 4,576,455
216 4,576,456

CLASS 354

173.11 4,576,457
199 4,576,458
287 4,576,459
400 4,576,460

CLASS 355

3 DD 4,576,463
4,576,465
4,576,466
3 R 4,576,461
4,576,464
10 4,576,467
14 R 4,576,462
15 4,576,468
29 4,576,469
38 4,576,470
50 4,576,471
4,576,472
68 4,576,473
75 4,576,474
91 4,576,475

CLASS 356

28 4,576,476
39 4,576,477
149 4,576,478
152 4,576,480
351 4,576,479
375 4,576,481
376 4,576,482

CLASS 357

17 4,577,207
23.4 4,577,208
23.5 4,577,215
30 4,577,209
34 4,577,211
38 4,577,210
68 4,577,212
69 4,577,213
74 4,577,214

CLASS 358

14 4,577,217
19 4,577,216
75 4,577,218
78 4,577,219
84 4,577,220
86 4,577,221
111 4,577,222
113 4,577,223
114 4,577,224
140 4,577,225
143 4,577,226
147 4,577,227
167 4,577,228
182 4,577,229
212 4,577,230
4,577,231
213 4,577,232
4,577,233
243 4,577,234
280 4,577,235
320 4,577,236
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226 4,577,296

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24 : 5,690

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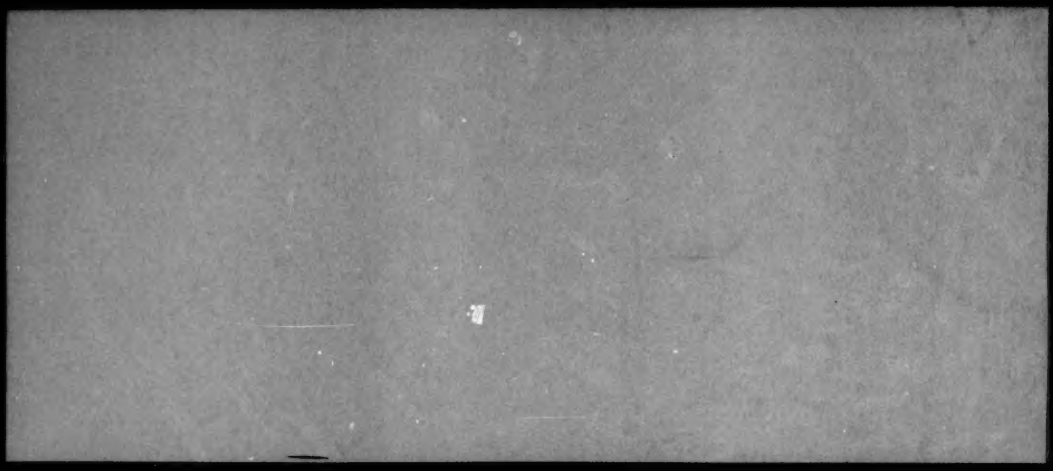

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